

tending nearly as far up as the umbilicus. A catheter could be readily inserted by way of the urethra into the bladder, but, owing to the presence of the blood-clot, no urine could be evacuated. The over-curved catheter of Brodie, the blood catheter of Gross, and the evacuating tube of the Bigelow apparatus were each employed without relief. The patient positively declined to permit the use of either aspiration or suprapubic cystotomy. As a last resort, a small sized Thomson's lithotrite was introduced and an effort made to crush and churn up the clots in the bladder, emptying the contents from time to time by means of the evacuating catheter of the Bigelow apparatus, and washing out the viscus with a 5 per cent. hot suprarenal solution. After a manipulation for the space of an hour and a half, the bladder was finally emptied; irrigation with a hot suprarenal solution and continuous drainage were instituted by means of a soft catheter. Large doses of ergot were administered. There was no future trouble from retention of urine, which continued to be streaked with blood for about a week.

Two days after the relief by this manipulation, he began to void what he described as "large pieces of stringy flesh," which followed each act of micturition. An examination of the material showed it to be a portion of the villous growth which had evidently been crushed or torn off whilst attempting to break up the blood-clot. The débris continued to pass for about one week after the attack of retention, and was accompanied by acute cystitis; from this the patient gradually recovered, the inflammatory symptoms subsiding, the urine becoming clear, and all signs of vesical irritability disappearing.

Up to the present time the patient has enjoyed excellent health. There has been no return of either hæmorrhage or vesical irritability.

Unfortunately, after convalescence, a cystoscopic examination was not permitted, so that it can only be surmised that in attempting to break up the clot by means of the stone-crusher the tumor was either torn from its attachment to the bladder-wall or so injured that decay of the foreign mass took place, when it sloughed and was discharged with the urine.

STATED MEETING, OCTOBER 5, 1903.

The President, RICHARD H. HARTE, M.D., in the Chair.

THREE CASES OF PERFORATED GASTRIC ULCER AND ONE CASE OF PERFORATED DUODENAL ULCER.

DR. JOHN H. GIBBON reported these cases, all of them having been operated upon during the present year.

CASE I.—A healthy-looking young man, eighteen years of age, was sent into the Bryn Mawr Hospital, January 12, 1903, by Dr. T. F. Branson, of Rosemont, and operated upon on January 13, 1903. The patient had been well except for some gastric discomfort, until the day of admission, when he was suddenly seized with severe abdominal pain. The sudden onset of pain occurred at 5.30 P.M. Dr. Branson saw the patient at 9.30 P.M., and Dr. Gibbon operated at 9.30 the next morning. When the abdomen was opened considerable flocculent fluid was found and the pelvis filled with it. The appendix was long, slightly adherent, and considerably inflamed. There was, however, no lymph about it, and it was not in a sufficiently bad condition to have been the cause of the general inflammation. The ileum was examined and found normal. Exploration was then carried up the colon, and the hepatic flexure with the omentum in its neighborhood was found covered with lymph. The incision was extended to the costal border and the duodenum found to be covered with lymph. When a portion of this was removed, a perforation into which a duck-shot could have been placed was found in the first portion of the duodenum. The perforation was inverted with difficulty because of the friability of the tissue surrounding it. However, three sutures deeply placed inverted it. The cavity was thoroughly irrigated with salt solution. Iodoform gauze was packed about the duodenum and hepatic flexure of the colon. The body of the stomach appeared normal. A gauze drain was then introduced into the pelvic cavity and the wound closed in layers. The patient was in an extremely bad

condition during the latter part of the operation, requiring the administration of oxygen: he, however, recovered promptly, and seemed in good condition a short time after the operation. The wound became infected and necessitated the removal of a number of the sutures. The gauze packing was gradually removed and the wound ultimately closed. The patient was fed by the rectum for three weeks, receiving nothing by the mouth excepting small quantities of water. An exception to this diet, however, occurred about two weeks after the operation, when he obtained and ate two and a half sticks of peppermint candy. This, however, produced no trouble, and he was discharged on February 27, 1903. After the operation it was revealed that the patient had had attacks of pain in the abdomen, but never sufficient to require a medical attendant. He suffered from pneumonia one year before operation, had never had typhoid fever, and had never been burned. He has been seen a number of times since his operation and has been perfectly well. He eats everything and suffers no discomfort. He has no hernia.

The interesting points in this case are: the fact that there was nothing in the patient's previous history which could possibly indicate a duodenal ulcer; the attacks of pain which have been spoken of were believed to have been due to the appendix. He had never had attacks of vomiting nor had he ever passed blood by the bowel. His pain and rigidity were present to a marked degree over the lower half of the abdomen, but more especially on the right side, and therefore the diagnosis of a perforative appendicitis seemed the most likely one. Another interesting point in the case is the length of time which the patient was kept upon rectal feeding. The rectal enemata consisted entirely of malted milk, which was suggested by Dr. Walter Chrystie, who had found it to be well retained and non-irritative.

CASE II.—A rather emaciated man of about fifty years, seen in consultation with Drs. Patrick and Sharpless, of West Chester, Pennsylvania. This patient had for several years been under the care of Dr. Patrick, who had treated him for gastric trouble. On Friday, April 6, 1903, at three o'clock, the patient, in lifting a buggy, was suddenly seized with excruciating pain in the upper part of the abdomen. Dr. Patrick did not see him until late the same evening, when he was somewhat more comfortable, the result of a hypodermic injection of morphia which had been

given. Dr. Sharpless saw the patient with Dr. Patrick, and agreed in the diagnosis of perforated gastric ulcer. The patient's family, however, would not consent to his removal to a hospital or to a surgeon seeing him until the afternoon following the perforation. He was seen by Dr. Gibbon first at ten o'clock on Saturday evening, thirty-three hours after the perforation had occurred. At this time he presented all the symptoms of a general peritonitis; the abdomen was distended, rigid, and painful, especially over the upper portion; the temperature had risen to about 101° F. and the pulse was 130 and weak. The patient was sweating and his facial expression was that of peritonitis. Two hours were consumed in obtaining consent for the operation from the patient's family and in removing him to the West Chester Hospital, which was but a short distance from his home. The operation was performed at midnight. When the abdomen was opened, a large quantity of yellowish fluid escaped with considerable gas. A large perforation was readily found in the anterior wall of the stomach at the greater curvature near the pylorus. The perforation was sufficiently large to admit the tip of the little finger. Because of its size the perforation was closed with considerable difficulty with catgut sutures. The stomach and the liver in its neighborhood were covered with thick lymph. After the closure of the perforation a second opening was made above the pubes and the pelvic cavity found to contain a large amount of fluid. The whole abdominal cavity was thoroughly irrigated with salt solution. In spite of stimulation, the patient's condition on the table became extremely bad. Gauze drainage was introduced into the pelvis and down to the site of perforation. Immediately after the operation a quart of salt solution was introduced into the patient's circulation. After the operation consciousness was promptly regained, and he was quite comfortable for several hours. In spite of stimulation, however, he died eleven hours after operation.

CASE III.—An anæmic girl of seventeen years was sent into the Bryn Mawr Hospital by Dr. George MacLeod on the first of May, 1903, and was operated upon the same day four hours after admission, about seven hours after Dr. MacLeod saw her. She was taken ill with pain in the abdomen about thirty-six hours before admission, but this did not become severe until about eight hours before admission, when she was greatly collapsed. Upon

her admission the abdomen was slightly distended, and there was exquisite tenderness on the left side, and the left rectus muscle was absolutely rigid. It was stated that a mass could be felt in the pelvis by rectal examination. The patient's temperature was 100° F. and pulse 116. No history of previous gastric symptoms could be elicited; because, however, of the suddenness of the attack and the localized point of tenderness on the left side near the umbilicus the reporter concluded that he had probably to do with a perforated gastric ulcer. The abdomen was opened below the umbilicus and the pelvis found to contain a quantity of dark yellow fluid containing flakes of lymph. The omentum above this incision was found adherent to the abdominal wall, therefore a second opening was made in a median line above the umbilicus. A perforation was found in the anterior wall of the stomach near the pylorus and lesser curvature: it was about one-quarter of an inch wide and three-eighths of an inch long. It was closed without difficulty with catgut sutures. The extravasation of fluid had been so extensive in this case that all of the small intestine was removed from the abdominal cavity and a most thorough irrigation with hot solution performed. A plain gauze drain was introduced into the pelvis and several iodoform gauze drains placed in the upper part of the upper wound, one being put directly over the point of perforation. The patient's condition on the table was bad, but she responded promptly to stimulation. The after-treatment was the same as in the first case, and the patient did well for about two weeks, when she showed some symptoms of obstruction of the bowel, which were accompanied by a rise in temperature and considerable abdominal pain. These symptoms progressed until it was quite evident that to relieve them the abdomen must again be opened. At this time, the seventeenth day after the first operation, the upper wound had practically healed, but there was still some discharge of pus from the lower wound. The gauze drain at this time did not extend deeply. The patient was anesthetized and the lower wound reopened. The small intestine was found matted together in a number of places, but in one place there was a distinct kink which might readily have produced all the symptoms of obstruction. In addition to this condition, however, it was found that the lower part of the pelvis was filled with foul pus. After liberating the adherent cavity and thoroughly irrigating the pelvic cavity drainage was introduced and

the patient returned to bed. After the operation she improved somewhat, but died from sepsis on the seventh day after the second operation and the twenty-fourth day after the first operation.

This case was one of subacute perforation with the discharge of the gastric contents into the pelvis, and, but for the complication which arose two weeks after the operation, the patient would have recovered, and this complication was the result solely of failure to reintroduce the pelvic packing sufficiently deep to keep up drainage. It is often difficult to reintroduce the packing as deep as it ought to go, and surgeons are too frequently content to get it simply within the peritoneal cavity.

CASE IV.—This patient, a man forty-five years of age, was admitted to the Pennsylvania Hospital on October 1, 1903, and was operated upon immediately. He had suffered for five years from what was supposed to be a duodenal ulcer; he was under the care of several capable men who carried out a rigid treatment. Previous to his admission he had been in bed for a number of weeks on rectal feeding, but during the past week has been allowed soft diet. He had never vomited blood until recently, but had vomited dark material, and melæna had been marked. At six o'clock on the morning of the day of his admission to the hospital, after a comfortable night, he was suddenly seized with severe pain in the epigastrium, accompanied by marked rigidity but no vomiting. Between seven and eight o'clock he was given two one-quarter of a grain doses of morphia hypodermically and then brought to the Pennsylvania Hospital from his home in Moorestown, New Jersey. When first seen by Dr. Gibbon at 2 P.M., his pulse was 112, respiration 24 and entirely costal, and temperature about normal. Soon after the onset of pain in the early morning his temperature was subnormal. His facial expression was bad, though he was not sweating. The abdominal wall was rigid, especially on the right side, in spite of the morphia which he had received. He was unable to pass his urine, though he had no pain in the lower portion of his stomach. There was a point of tenderness in the epigastrium. When the abdomen was opened through the right rectus muscle a quantity of yellowish fluid containing small flakes of lymph escaped. The gastrocolic omentum was slightly adherent on the right side; the great omentum, however, was entirely free excepting over the right kidney, where it apparently had been adherent for a long time. The

duodenum was quite free, and there was no evidence of ulceration in it. On the anterior wall of the stomach, however, about one and a half inches or two inches from the pylorus, and just bordering on the lesser curvature, there was an area covered with lymph, which was removed and two points of perforation about the size of a head of a pin discovered. The lesser omentum was extensively adherent around the ulcer. Because of the situation of the ulcer exactly at the lesser curvature, it was difficult to close it, and in doing so the operator was obliged to utilize the lesser omentum, sewing it firmly to the gastric wall beyond the perforation. The abdominal cavity was then irrigated throughout, a small suprapubic opening being made and a glass drainage tube introduced to the depth of the pelvis. A large gauze drain was placed over the point of perforation and the upper wound partially closed. The lower wound was drained with a glass tube, into which was passed a gauze wick. The operation required thirty minutes, and the patient stood it very well. He was anesthetized first with chloride of ethyl, which was followed by ether. At the end of the operation his pulse was 120, his temperature a little above the normal, and he was in fairly good general condition. It seemed evident, from the appearance of the adhesions about the ulcer, that an earlier perforation had been prevented by the adherence of omentum, and that with the progression of the ulceration the omentum proved an insufficient control. It seemed wise to do a thorough irrigation of the abdominal cavity because there was considerable free fluid, and the pelvis was drained because a number of pieces of lymph passed up through the tube during the irrigation.

October 10.—Tube has been removed from pelvis and gauze drain in upper wound changed twice. Temperature has been normal for a number of days, and there has not been a single bad symptom since operation. The rectal feeding continues satisfactory, and the patient bids fair to make a satisfactory recovery.

DR. WILLIAM L. RODMAN said that gastro-enterostomy is hardly radical enough for the treatment of non-perforating gastric ulcer. It is not certain that it will relieve hæmorrhage; it does not remove the lesion; it does not enable the surgeon to determine if there be more than one ulcer; and it does not get rid of cicatrices which later on may undergo malignant degeneration. According to the best authorities at least 6 per cent. of gastric ulcers

terminate in carcinoma. The frequency of perforation, hæmorrhage, and other complications of ulcer, many of them occurring most unexpectedly, would make it seem wise in the future to excise the ulcer-bearing area before such complications occur. This can be done without great difficulty or risk of danger, as in probably 80 per cent. of all cases the ulcers are near the pylorus and the lesser curvature of the stomach, and can easily be excised at one time. The mortality from this operation should not be more than from 5 to 10 per cent., while the mortality from gastric ulcers treated by medical means is known to be much higher, some writers placing it as high as 50 per cent. Dr. Rodman closed by asserting his belief that the future treatment of gastric ulcer should be largely operative, and consists in excision of the ulcer-bearing area instead of simply the ulcer itself. In his advocacy of this method at recent meetings of national societies, he has found that similar views are held by many eminent surgeons.

DR. MORRIS J. LEWIS stated that he had seen in consultation with Dr. J. A. Scott, one year ago, the fourth case reported by Dr. Gibbon towards the close of the patient's fourth attack. At this time the symptoms, it was thought, pointed rather more to duodenal than to gastric ulcer. There had been epigastric distress coming on some time after eating, and blood in the evacuations, with some nausea, but without vomiting. During the summer the patient improved greatly and gained fifty pounds in weight. One month ago, symptoms of trouble reappeared; there was pain two or three hours after eating, and vomiting of blood. Under rectal feeding the symptoms ameliorated, but one week after recommencing very careful feeding by the stomach the patient awoke with excruciating pain in the left shoulder-blade, which soon transferred itself to the cardiac region and then to the epigastrium, when the diagnosis of perforation was made and the patient brought to the hospital.

Pain in the scapular region as a symptom of gastric perforation is unusual, and worth remembering.

DR. J. ALISON SCOTT said that the physical signs in the case referred to by Dr. Lewis presented some interesting points in diagnosis, it being distinctly an atypical case, if one is to believe text-book statements. It is stated that gastric ulcer is found in cases of extreme hyperacidity, and that the result of an old ulcer is usually puckering of the tissues, resulting in more or less

obstruction of the pylorus. Hence we should expect to find a dilated stomach and hyperacidity of its contents. In the case under consideration there was not only the absence of hyperacidity, but there was actually an acidity, and the patient's stomach was absolutely normal in size. These points, in conjunction with the facts that there was no vomiting, and that the blood in the stools was fully digested and recognized only by chemical tests, made the diagnosis of gastric ulcer in the early stages of the case extremely difficult. The history during the month preceding perforation, although he did not then see the case, was more that of the typical symptoms of gastric ulcer. Dr. Scott believes that cases of gastric ulcer are not so common in this country as in England. In a somewhat extensive hospital experience he has not seen more than ten to fifteen cases, and has never in his hospital or private practice been in charge of a case when perforation occurred.

DR. ADDINELL HEWSON said that the presence of fluid in the lower right portion of the abdomen, and the consequent rigidity of the abdominal wall in that region as found by Dr. Gibbon in his cases, can be explained by the anatomical relations of the involved structures. The attachment of the mesentery extends downward from left to right, and the omentum in its projection downward from the stomach extends more to the left than to the right. The mesentery is attached to the posterior abdominal wall, the intestines occupy the space forward, and the duodenum, under the greater curve of the stomach and the omentum, fills in the interval between. Hence fluid from the perforations in question will first pass downward on the right side. Later it may pass upward and towards the left, but not until the lower right portions of the abdomen are occupied by the fluid which follows the posterior attachment of the mesentery to the parietal peritoneum. When the perforation is on the posterior wall of the stomach, the course would not be the same were it not for the fact that the mesenteric attachment of the pyloric end is not so long as that of the cardiac end. Even when the fluid comes from a perforation on the ventral wall of the stomach, it is possible for it to take the same direction as when it comes from the duodenum or the pylorus or the posterior wall.

DR. FRANCIS T. STEWART reported two cases of perforation of the stomach operated upon with recovery of both. The first was that of an apparently healthy bar-tender aged twenty-four years,

who had never suffered from indigestion, and who had never vomited blood or passed blood from the bowel. Soon after taking a hearty dinner of lamb chops and peas the patient was seized with severe pain in the epigastric and umbilical regions, and later vomited the materials composing the dinner, but no blood. When seen soon after there was general tenderness and rigidity, but most marked over the right upper quadrant of the abdomen. Liver-dulness was present, and there was no dulness in the flanks. The leucocyte count was 18,000, and within an hour rose to 19,000. Blood-pressure was 235. A diagnosis of perforated gastric ulcer was made and operation performed five hours after its occurrence. A perforation one-eighth inch in diameter was found one-half inch from the pylorus near the greater curvature of the stomach. It was closed with a purse-string suture reinforced by Lembert sutures. A second abdominal incision for drainage was made below the umbilicus. Recovery followed.

The second case was that of a gunshot wound of the stomach in a boy of eleven years, the bullet having entered below the costal arch on the left side. When the patient was seen four hours after the injury there was abdominal rigidity, though neither this nor tenderness was marked; liver-dulness was present, and there was no dulness in the flanks. There was no vomiting. Operation was performed four hours after the injury was received. The bullet had passed through the stomach near the cardiac end. Both wounds were closed by purse-string, reinforced by Lembert sutures; the abdomen closed without drainage, and the bullet removed from where it was lodged immediately beneath the skin of the back. Both patients made uneventful recoveries.

DR. GIBBON, in closing, emphasized strongly a point mentioned in his paper, namely, the extensive induration of the stomach wall in his fourth case. He referred to the number of cases of supposed gastric cancer, reported as such, in which gastro-enterostomy has been followed by recovery and apparently by the disappearance of the cancer. These probably have been cases of ulcer with pronounced induration. In the case in question, Dr. Gibbon believes that if the induration present had been in the pylorus he would have pronounced it malignant. He recalled the case of a woman upon whom he had operated, and who had a clear history of gastric ulcer some ten or twelve years previous. When he saw the patient she was vomiting, and pre-

sented other symptoms of acute obstruction of the pylorus. Operation revealed a mass that was thought to be pyloric carcinoma. The patient was anæmic and in bad general condition, and gastro-enterostomy was performed with the idea of doing a subsequent pylorotomy if the patient's condition improved sufficiently to warrant that operation. She vomited a great deal after the operation, and did not do well for a time, but finally made a good recovery. Her condition now is satisfactory enough to support the hope that the pyloric mass was only an extensive infiltration around an old gastric ulcer.

TWO CASES OF PERFORATION DURING TYPHOID FEVER
TREATED BY OPERATION ENDING IN RECOVERY.

DR. ROBERT G. LE CONTE said that in reporting these two cases, and referring to a third one, the three having been operated upon last month at the Pennsylvania Hospital, he did not wish to give the impression that the operative cases of that institution are always successful. Their statistics in this dreaded complication are just as bad as those of other hospitals, and it is simply a coincidence that two cases following each other should have been successful. The third case mentioned occurred in the service of Dr. Gibbon, which recovered from the primary operation, but died ten days later from a secondary perforation.

CASE I.—J. S., hatmaker, Russian Jew, aged thirty-eight years, was admitted to the Pennsylvania Hospital July 21, 1903. Owing to his nationality, it could be learned only that the patient had been ill in bed four weeks with fever. He was evidently suffering from an attack of typhoid fever of moderate severity. On admission his temperature was $102\frac{2}{5}$ ° F.; respirations, 32; pulse 108, regular but weak. Tongue moist, slightly coated, very tremulous; lips covered with sordes; abdomen soft, rounded, no tenderness and no spots. Spleen easily palpable but not tender. Urine showed faint trace of albumen without casts. The day after admission a Widal test was made, and another five days later, both proving negative. The fever ran a moderate course, and twelve days after admission the temperature touched normal for the first time. The convalescence from this time on was uninterrupted, and the patient left the hospital August 17, fifty-six days after the onset of the attack.

He was readmitted to the medical wards under the care of

Dr. Stengel, September 8, 1903, twenty-two days after his discharge from the hospital, complaining that for the past few days he again had fever and felt badly. The temperature was $103\frac{3}{5}$ ° F.; pulse, 112; respirations, 28; tongue coated white, edges and tip red, very tremulous; a few râles posteriorly on the right side of the chest. Spleen enlarged, palpable, and tender; abdomen well rounded, soft, flabby, slightly tender, with a few suspicious rose spots. Urine, slight trace of albumen and a few hyaline and granular casts. A Widal test was suggestive but not positive. For a week the man went through a moderately severe relapse, with quite marked hebetude. He received thirteen baths and fourteen sponges, one alternating with the other when his temperature rose to 102° F. or over. On the evening of the 15th of September, the eighth day after admission, he informed the night nurse that he had had pain in the abdomen for the greater part of the day, but that it did not become severe until 7.30 P.M. At five o'clock that day his temperature was $101\frac{1}{5}$ ° F., and at 9 P.M. it had fallen to $97\frac{4}{5}$ °; respirations, 24; pulse, 100. At 10.30 the patient broke into a profuse perspiration, with shallow respirations and anxious expression. At this time the temperature was $97\frac{3}{5}$ ° F.; pulse, 140; respirations, 40; abdomen tympanitic, rigid, and tender, especially on the right side. A diagnosis of perforation was made, but permission for operation was delayed until friends could be communicated with. At 2 A.M., September 16, ether was administered, and a three-inch incision made in the right semilunar line below the umbilicus. This was three hours and a half after the patient showed signs of collapse, six hours and a half after the onset of severe pain, and perhaps fifteen or eighteen hours from the first pain noticed. On opening the abdomen, some cloudy, non-odorous fluid escaped. The cæcum immediately presented. It was brought out of the abdomen and a search for perforation was begun at the ileocecal valve. About eight inches from the cæcum a large inflamed Peyer's patch was found in the ileum, with a perforation in the centre about the size of the lead in a pencil. This was invaginated with a running Lembert suture of silk reinforced with three or four interrupted Lembert sutures. No other inflamed areas were discovered on the bowel. The pelvis contained some turbid fluid, but no lymph flakes. The operating table was tilted so that fluids would gravitate to the pelvis and to the right side of the

abdomen while the cavity was being irrigated with salt solution. The pelvis was then mopped dry, a rubber tube inserted to the bottom, and five wicks of gauze were run in various directions between the coils of intestine to a distance of two or three inches from the wound. One suture was then passed through the wound and tied to retain the intestines within the abdominal cavity, the remainder of the incision being filled with gauze. Time of operation, thirty minutes. The patient reacted well, and vomited once a small amount of dark brown liquid. Temperature immediately after operation, $98\frac{2}{5}$ ° F.; pulse, 128; respirations, 40. The convalescence was uninterrupted, but movements of the bowels had to be secured by enemata of soap and water. The gauze wicks were removed forty-eight hours after operation and the tube leading to the pelvis on the seventh day. The latter was replaced by a narrow wick of iodoform gauze. The temperature reached normal eight days after operation, and convalescence was uninterrupted. Cultures taken from the peritoneal fluid at the time of operation showed numerous streptococci pyogenes, and also a few streptococci pyogenes aureus.

It will be noted that in this case at the time of his first attack of fever the Widal reaction proved negative, and during the relapse the Widal was only suggestive, and not positive.

CASE II.—A. G., Russian laborer, aged twenty-one years, was admitted to the Pennsylvania Hospital August 25, under the care of Dr. Stengel. He had been ill for ten days previously with fever, headache, slight cough, and hebetude. Examination revealed a well-built, well-nourished man; tongue coated, edges and tip red; a few râles in the upper lobe of the right lung, with slightly diminished resonance. Abdomen well-rounded, tympanitic, soft, with slight tenderness, and no pain. Spleen enlarged, palpable, and tender. Surface of abdomen and chest showed several rose spots. Urine contained trace of albumen and a few hyaline casts. Widal test positive. His temperature shortly after admission was $104\frac{4}{5}$ ° F.; pulse, 104; respirations, 24. Tubing was resorted to each time the temperature reached 102° or over, and in the next six days he received twenty-eight baths. At this time, estimated the sixteenth day of the disease, immediately after a bath at 6 P.M., he complained of sharp pain in the right side of the abdomen, with rigidity and tenderness. There was no vomiting. A blood-count an hour later showed 9600 leucocytes. Pain

and tenderness at this time had increased, and also the rigidity. Temperature was 100° F.; pulse, 110; respirations, 24. At 11 P.M., four and a half hours after the onset of pain, operation was undertaken by Dr. Mitchell in the absence of Dr. Le Conte. Ether was administered, and a three-inch incision made in the right semi-lunar line below the umbilicus. A slight amount of turbid fluid escaped. One foot from the cæcum a large necrotic ulcer was seen, with a small perforation about the size of the head of a pin, from which a small amount of gas was escaping. Very little lymph was present, and no attempt at walling off. The perforation was inverted with two rows of Lembert sutures, abdominal cavity washed out with salt solution, and a gauze wick inserted in the pelvis and another at the site of perforation; wound partially closed with through-and-through silkworm-gut sutures.

After operation reaction was good; no vomiting; temperature rose rather rapidly to 104° F. and then subsided gradually, so that by the seventh day it reached normal for the first time. The abdomen continued soft without distention. Bowels moved with enemata. Packing was finally removed on the eighth day after operation. After the temperature had been normal for ten days there was again a rise, with signs of a relapse of fever. This continued for sixteen days, during which time he received thirty-four spongings, when the temperature was 102° F. and over. Convalescence is now again established.

The successful results obtained in these two cases are unquestionably due to the fact that both patients had more or less classical symptoms of perforation. The diagnosis having been readily and quickly made, operation speedily followed.

In the first case the man said that for some hours he had had abdominal pain. This pain must have been slight, for it was not sufficient for one of his race and nationality to speak of it until several hours had passed; then the pain became severe, and shortly afterwards signs of collapse were present, with subnormal temperature, rapid, weak pulse, rapid respiration, profuse perspiration, and anxious facial expression. From the onset of the symptoms of collapse three hours and a half intervened before operation.

In the second case the first sign of perforation was sharp pain immediately after a tub bath, which was quickly followed by rigidity, tenderness, and a relatively high leucocyte count,

a fall in temperature, and a rise in the pulse-rate. From the onset of this pain four hours and a half elapsed before the operation was undertaken. In neither case was there any attempt on nature's part at walling off the perforation from the general peritoneal cavity. In both cases the perforated area seemed to be in contact with the parietal peritoneum. It is known that the parietal peritoneum is very much more sensitive and reacts more quickly to an irritant than the visceral peritoneum, and it may be that in this fact there is a reason why some of the cases immediately present classical symptoms of perforation, while in others the onset is so gradual that the diagnosis cannot be made until the patient is practically beyond operative relief. Given a perforation which is surrounded by coils of intestine or covered by omentum (the least sensitive portions of the peritoneal surface), it might be hours or even days before the inflammation extended to the parietal peritoneum, with the appearance of severe pain, rigidity, and marked tenderness. The reporter had observed—but on this point he was not entirely certain—greater pain, tenderness, and rigidity of the abdominal wall when an inflamed or perforated appendix is in contact with the parietal peritoneum, and that the symptoms are much less marked when such an appendix is surrounded or walled off by intestinal coils. This suggestion was made only as a possible explanation for the slow and gradual onset of symptoms sometimes observed in perforating cases. When a condition of profound toxæmia is present, one would naturally look to this for a masking of the abdominal symptoms.

DR. J. ALISON SCOTT confessed his inability to diagnose perforation on all occasions. He had made a careful study of many of these cases at the Pennsylvania Hospital, and finds that they do not show any one thing that is diagnostic of perforation. Neither temperature, pulse, nor respiration is constant. Rigidity, pain, and the symptom complex are most to be depended upon. Something in the appearance of the patient that can hardly be described is often suggestive. And yet all these points may be demonstrated in a patient and operation reveal no perforation. However, it is better to make this mistake occasionally than to let cases go unrecognized.

DR. JOHN H. GIBBON said that he was convinced that perforation of the large bowel is more insidious and presents more difficulty in diagnosis than does a like condition in the small intes-

tine. He cited a case of perforation of the sigmoid in which adhesions had formed. When the abdomen was opened there was escape of gas, but only a small quantity of fluid was present. The perforation was exposed only when the sigmoid was separated from the abdominal wall to which it was adherent. Dr. Gibbon said that he felt that local anæsthesia was not so popular in Philadelphia as in some other cities, but it worked very satisfactorily in the above case. The man was very ill and delirious, and he decided to open the abdomen under cocaine and determine if perforation had occurred, and then employ ether if necessary. No pain was complained of until the sigmoid was dragged upon, and then ether was given. A series of seven cases of perforation operated on under local anæsthesia with three recoveries, which is reported by Hays, of Pittsburg, speaks well for this method of anæsthesia. One can trust to cocaine for exploratory incisions if one-fourth grain of morphine be given hypodermically fifteen minutes before operation. If prolonged operation is found necessary after the exploratory incision, ether can be given. Dr. Gibbon then discussed the treatment of threatened perforation in cases that are being operated upon. He has lost two patients from secondary perforation,—one on the second, the other on the tenth day after operation for the first perforation. In the first case the second perforation occurred promptly after the first, but in the second it was not suspected until shortly before death. At the operation only one ulcer seemed in imminent danger of perforation, and it was inverted. Autopsy showed that one had perforated which had shown no signs of it at the time of operation ten days before. In the second case an ulcer seemed on the point of perforating, but it was situated so near the ileocæcal valve and the surrounding tissue was so friable that attempts at inversion were unsuccessful. An expedient which will not be again used was then employed. It consisted in wrapping the omentum around the intestine in such a manner as to cover the weakened area, the enveloping structure being held in place by a gauze pad. Perforation, as stated, occurred on the second day, before sufficient adhesions had formed to prevent the escape of the intestinal contents. Better results would no doubt have been secured had the gauze been placed next to the intestine or had the omentum been sewed to the intestine. One of the latter plans will be adopted in any future similar case.

DR. WILLIAM J. TAYLOR believes that the mortality in operations for typhoid perforation is in direct proportion to the size of the opening in the bowel. In two cases which he operated upon early, within one and one-half hours after perforation was diagnosed, there were large openings in the intestines and profound infection of the peritoneal cavity. Cases ending in recovery generally have small openings and but a comparatively slight amount of fluid in the belly. This fact urges early operation in cases of perforation.

DR. JOHN H. JOPSON cited a case corroborating Elsborg's statement that the symptoms of perforation in a child do not differ from those of an adult. He operated upon a child of six years, one of the youngest patients on record, who was admitted to the hospital twenty-four hours after perforation had occurred during the third week of the disease. The child had severe abdominal pain, vomiting, etc., in fact, being sent in as a case of peritonitis. When seen thirty-six hours after perforation the symptoms were typical, differing in no way from those seen in the adult. The child lived three days after operation.

DR. WILLIAM L. RODMAN agreed with Dr. Scott that there was no one characteristic symptom or sign of perforation. He also believed that rigidity and pain, with the addition of a sub-normal temperature, are the most reliable indications. Considering the present difficulty in diagnosing perforation itself, it does not seem that Cushing's suggestion of operating in the pre-perforative stage can be attempted. We must be further along in the matter of diagnosis before doing that, however desirable it may be. When in doubt regarding the presence of perforation, Dr. Rodman advises exploratory incision under cocaine. He has used this in two cases, one of which he was sure was hæmorrhage instead of perforation. He operated at the solicitation of two medical colleagues, and found blood in the bowel but no perforation. This finding was confirmed by autopsy, death occurring later from a second hæmorrhage. He recovered from the operation, and would have probably recovered but for the second hæmorrhage. An interesting feature in this case was that the medical men were misled by the leucocytosis present. Dr. Rodman emphasized the fact that the sooner we operate in these cases the better are the results. Statistics regarding the result of operation are becoming better because surgeons no longer wait for the

subsidence of shock. As in gunshot wounds of the intestine, we should operate at once and not wait too long. He has operated on but one case, and recovery followed, though thirty-seven hours had elapsed since perforation and general peritonitis were marked. As to Dr. Taylor's statement regarding the size of perforation, the end of a finger could be put in the opening in this case. It was true, however, that not a large amount of fluid had escaped, the presence of lymph and the adherent omentum preventing great extravasation into the peritoneal cavity. Regarding local anæsthesia, Dr. Rodman said that the abdomen can be opened without giving the patient much pain. The intestines can be handled quite freely without causing pain, pinching the parietal peritoneum with forceps causing the greatest discomfort. He has performed one laparotomy under anæsthesia induced by carbolic acid alone, cocaine not being employed.

DR. R. P. McREYNOLDS has operated upon five cases of typhoid perforation; in four the diagnosis was made too late and death resulted from general peritonitis. In two cases coming to autopsy the operative result was good; the perforation being entirely closed. In one case, when the perforation was closed, the omentum was stitched over the ulcer in order to reinforce, and at the same time to prevent adjacent ulcers from perforating. The leucocyte count in these cases was misleading; in the last case it was only 8900, and for this reason we were not urgent enough for immediate operation. If we depend upon the leucocyte count alone, we will lose our patients. We thought the question of consultation to be an important one. If medical men see the case first and then send for the surgeon much valuable time is lost. In hospitals it would be better to send for a surgeon as soon as a typhoid fever patient shows any sign of perforation, and if he thinks an operation is indicated go ahead at once without waiting for a consultation.

DR. FRANCIS T. STEWART gave a brief analysis of eight cases of perforation in typhoid fever operated upon by him with two recoveries. Six were males, two females; ages varied from nine to forty-two years; the period of the disease varied from the thirteenth day to the fifth week; the time of operation after perforation was three, twelve, twelve, fourteen, nineteen, and forty-eight hours respectively in six cases, the other two being unknown. The first and one of the last two recovered. Many of the follow-

ing statistics refer to six cases only, as but little was known of the other two. There was previous abdominal pain in two, none in the others; all had pain when perforation occurred; there was tenderness and rigidity in all; vomiting was absent in five; the temperature fell in one, rose in one, remained unchanged in four; pulse and respiration were accelerated in all; seven had distention and thoracic breathing; liver-dulness and dulness in the flanks were absent in six; the leucocyte count in four cases was respectively four, seven, ten, and eighteen thousand; the perforation in all was within three feet of the ileocaecal valve; the size of the opening varied from that of a pinhead to a quarter-dollar; free fluid was found in the abdomen of each, being clear in one; in only one was there any attempt at walling off the perforation by adhesions; two of the patients had been walking about until the occurrence of perforation; four were admitted as emergency cases, four were in the hospital when perforation occurred; ether was used in seven cases, cocaine in one. Dr. Stewart does not agree with Dr. Gibbon regarding the use of local anaesthesia in these cases, but prefers ether. Cocaine for exploratory incisions is of value, but for treatment is not satisfactory, as good work cannot be done upon a frightened, struggling patient. In addition to this point, the abdomen cannot be properly cleansed when only cocaine is employed. Drainage was employed in seven of the eight cases reported; in one the peritoneum seemed normal; drainage was not employed, and the patient recovered; none of the patients had a chill at the time of perforation; the Hippocratic facies was present in six, being absent in the two that recovered; auscultation was negative in seven, peristalsis being present in one of the patients that recovered; the diagnosis of perforation was made in five and the incision made in the right iliac region, the median incision being used in the others, in which a diagnosis of perforative peritonitis was made.

DR. JAMES P. HUTCHINSON has seen the diagnosis made and operation performed in twenty cases of perforation in typhoid fever. Generally speaking, physicians are not inclined to call a surgeon in these cases as early as the latter would like. In doubtful cases operation should be performed, as those patients not suffering from perforation are not harmed by the exploratory incision. Dr. Hutchinson does not agree with Dr. Taylor regard-

ing the effect of the size of the opening in the intestine. The peritoneum is more tolerant in patients having typhoid fever than is generally supposed. He believes that there is in every case a small perforation first, and that the opening gradually becomes larger. In some of the cases seen there was reason to believe that as many as four days had elapsed before symptoms became pronounced. He believed that perforation had been present in many cases longer than usually supposed, and during the most of this time the presence of faecal matter has been withstood. Ether is considered by Dr. Hutchinson to be the best anaesthetic. It does not do as much harm as the fright when local anaesthetics are employed. A large part of the time taken by these operations is employed in washing the abdomen, and during this period the ether can practically be dispensed with. In cases of perforation where there is not a large amount of fluid and the infection is distinctly limited, the area should simply be wiped with gauze and not flushed; flushing will carry the infection throughout and make the condition worse.

DR. LE CONTE, in closing, referred to the condition mentioned by Dr. Gibbon where a considerable area of inflamed bowel is present with a number of suspicious ulcers threatening perforation. In the presence of such a condition he did not believe it wise to invaginate with sutures these suspicious ulcers, or to cover them with omentum, as there was grave danger of their breaking down. He preferred to isolate such areas of the intestine from the general peritoneal cavity with walls of gauze, and to permit the ulcers to perforate if they would do so. A case was cited in which a dozen highly inflamed and thin areas were present in the last two feet of the ileum and in the caecum, in which this entire area was isolated from the rest of the peritoneum by gauze. Within forty-eight hours some of these ulcers perforated with the formation of faecal fistulae. These fistulae closed spontaneously in three weeks, and the patient recovered without further operative treatment.

HERNIA FOLLOWING OPERATION FOR APPENDICITIS.

DR. WILLIAM J. TAYLOR presented a man, aged twenty-six years, always healthy and strong, except for an attack of appendicitis six years before. From this he made a complete recovery, and had no symptoms of recurrence until October 2, 1901, when

he was seized with acute pain in the right side. Two days afterwards he was operated upon, and believes the appendix was removed and no pus was found, as the wound was closed without drainage. The sutures were removed on the fifth day, the wound apparently perfectly healed, and he remained in bed about five weeks to insure absolute closure of the wound. When he got up he wore a bandage with a pad over the site of the wound.

Towards the end of December, or nearly three months after this operation, he first noticed a little bulging at the lower angle of the wound; this gradually increased, in spite of wearing the bandage, until a very distinct and well-developed hernia resulted. He had a good deal of pain and discomfort, and for three or four weeks before he was seen by Dr. Taylor had almost constant pain. When he presented himself, there was a well-developed hernia about the size of the closed fist, which could not be entirely reduced. It was directly over the wound, and had dissected under the skin latterly towards the flank. An opening in the belly wall about an inch in diameter could be distinctly demonstrated.

On January 14, 1902, or fifteen months after the original operation, an incision was made to the outer side of the scar, and the hernial sac exposed. An opening was found about an inch in diameter in the belly wall; to this was adherent omentum and bowel, which were both anchored outside of the belly cavity. There was an immense number of adhesions everywhere, and the omentum had to be dissected away with great care. The hernial sac and its surrounding fibrous tissue were taken away also. The edges of the opening were freshened, the layers of the belly wall dissected loose, and three layers of suture were placed in the deeper tissues. The wound was then closed by interrupted silkworm-gut sutures, about six strands of silkworm gut introduced in the wound for drainage. The wound came together nicely, but there was a fair amount of tension on the stitches.

In the opinion of Dr. Taylor, undoubtedly at the time of his first operation a stitch had given way, or else the closure of the wound was not sufficiently accurate. The patient says that he vomited excessively after the operation, and a small portion of the omentum was forced out in the incision and caught. Along this path the hernia developed.

The reporter stated that he had seen quite a number of cases

of hernia following abdominal operations, and had operated upon a number of them. In all instances there has been a portion of omentum, and at times bowel anchored outside of the belly cavity and attached by adhesions to the hernial sac.

This explains the extreme difficulty of complete reduction in most of these cases, and also the discomfort produced by any form of truss or bandage. For this reason he would urge very strongly that operation be done and a definite closure of the opening in the belly wall made in all of these cases. A hernia through the belly wall which gives any discomfort ought not to be allowed to remain for any length of time without an attempt being made to close the opening by operation. The after results in this case were perfect. His recovery was uneventful and uninterrupted.

DR. WILLIAM L. RODMAN cited a case which had been a source of surprise to him. He operated upon a clean case of appendicitis, using the gridiron incision, securing primary union; but the patient returned some time later with a large ventral hernia. Why it occurred is not understood, as the layers were sutured separately with kangaroo tendon and chromicized gut. The patient attributed the hernia to a fall which she received a few weeks after operation. It has been said that hernia cannot occur after the gridiron operation, hence this case is put on record. In many such operations it is the only hernia he has seen where primary union was secured.

DR. ROBERT G. LE CONTE said that in closing an abdominal wound without drainage he always used through-and-through sutures of silkworm gut, with catgut to unite the layers of the fascia, and had never had a hernia follow this method of closure. The approximation of the fascia is of much more importance than that of the peritoneum.

NECROSIS OF ENTIRE LOWER JAW.

DR. ROBERT G. LE CONTE exhibited a lower jaw which he had removed that day from a child four and a half years old. Two weeks previously the child was said to have been perfectly well. The trouble began with pain in one of the teeth on the right side of the lower jaw. This was speedily followed by swelling of the right side of the face, fetid breath, discharge from the mouth, and high fever. When seen the child was almost in a typhoid condition, with great swelling of the right side of the

face, temperature 104° F., a gangrenous condition of the alveolus, fetid breath, etc. On a hasty examination the case was thought to be one of noma, but after ether had been given it was found that the whole lower jaw was the seat of a fulminating, gangrenous osteitis. The mucous membrane covering the mental portion of the jaw was incised within the mouth, the jaw divided, and each half removed separately with sequestrum forceps by aid of very light traction. The cavity remaining was then curetted and the gangrenous tissue cut away with scissors, hæmorrhage being controlled by iodoform gauze packing. The patient's condition is most serious from systemic sepsis.

STATED MEETING, NOVEMBER 2, 1903.

The President, RICHARD H. HARTE, M.D., in the Chair.

OSTEITIS DEFORMANS.

DR. JOHN B. ROBERTS said that he had reported a case of leontiasis ossium, or hypertrophy of the bones of the face, at a meeting of the Section on Surgery of the College of Physicians of Philadelphia, November 8, 1895 (*ANNALS OF SURGERY*, 1896, Vol. xxiii, p. 303). The woman, who was twenty-two years of age, had suffered from the time she was six years old with a slowly increasing enlargement of the upper and lower jaw-bones. Such cases are supposed by some writers to be an early stage of osteitis deformans. He had unsuccessfully endeavored to find the woman mentioned, in order to see whether there has been any change in her condition that would throw light on the possible relationship of these two disorders of the bones.

Leontiasis ossium, sometimes called Virchow's disease, and osteitis deformans, often called Paget's disease, are evidently, in his opinion, trophoneuroses. The two conditions are therefore probably related, even if the disease manifested by enlargement of the bones of the face is not actually osteitis deformans, beginning in the facial bones instead of in those of the extremities and cranium. He presented an illustration of the face of the young woman. ("Deformities of the Face." By John B. Roberts. Second Edition, 1901, p. 19.)

Now he reported a case of typical osteitis deformans occurring in a man. The patient, sent to him about a year ago by Dr. H. E. Schlemm, had applied to that physician because of his increasing loss of stature, which had attracted the attention of his friends; otherwise he had, in his own opinion, no special symptoms of illness, except that he had been of late somewhat below par in general health. The bony lesions, other than the diminution of height, had been unobserved.

The gentlenian, who was aged forty-seven years, and un-