STATED MEETING, APRIL 6, 1903.

The President, Richard H. Harte, M.D., in the Chair.

CONGENITAL DISLOCATION OF BOTH ULNÆ AT THE WRISTS.

Dr. Charles F. Kieffer reported the case of a negro man, thirty years old, by occupation a soldier, who, on presenting himself for physical examination for re-enlistment, attracted attention by the prominence of the head and styloid process of the ulna at each wrist. On examination, the left ulna was found completely displaced, overriding the dorsal surface of the carpus. The right ulna was similarly displaced, but not so completely. By strong pressure on the head of the ulna and counter-pressure on the carpus, the bone on each side could be forced a little way in the direction of its proper position. The photographs show the deformity quite well. Two radiographs also were presented,—one with the hands flat on the plate and the other with the hands on the ulnar edges, the light in both instances coming from above. The radiograph with the hands flat shows the ulna in each wrist slightly displaced outwardly. It gives no hint in either wrist of the presence or condition of the triangular fibrocartilages. The radiograph with the hands on edge is, unfortunately, not quite so clear as the first, but it shows very well how completely the ulna in both wrists is lifted above the plane of the wrist-joint.

The man says that, to the best of his knowledge, his wrists have always been as they are now. Indeed, he never suspected that there was anything unusual about them. He has been a good deal of an athlete and is a very good ball-player, showing that the deformity, as such, has produced no loss of function. Mobility is not impaired, nor would we expect much impairment on account of the secondary part the ulna takes in the function of the wrist-joint.

This condition is very rare. What may be considered a partial development of it is sometimes encountered, where there is unusual mobility of the radio-ulnar articulation due to relaxation

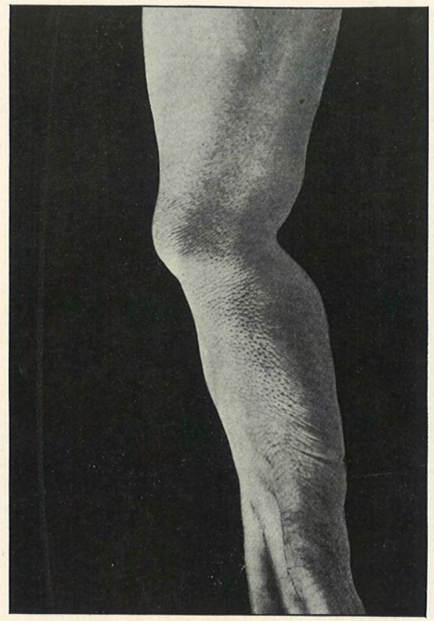


Fig. 1.—Congenital dislocation of ulna.

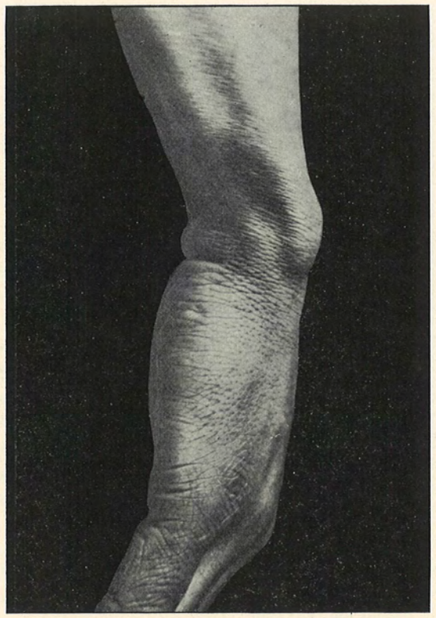


FIG. 2.—Congenital dislocation of ulna.

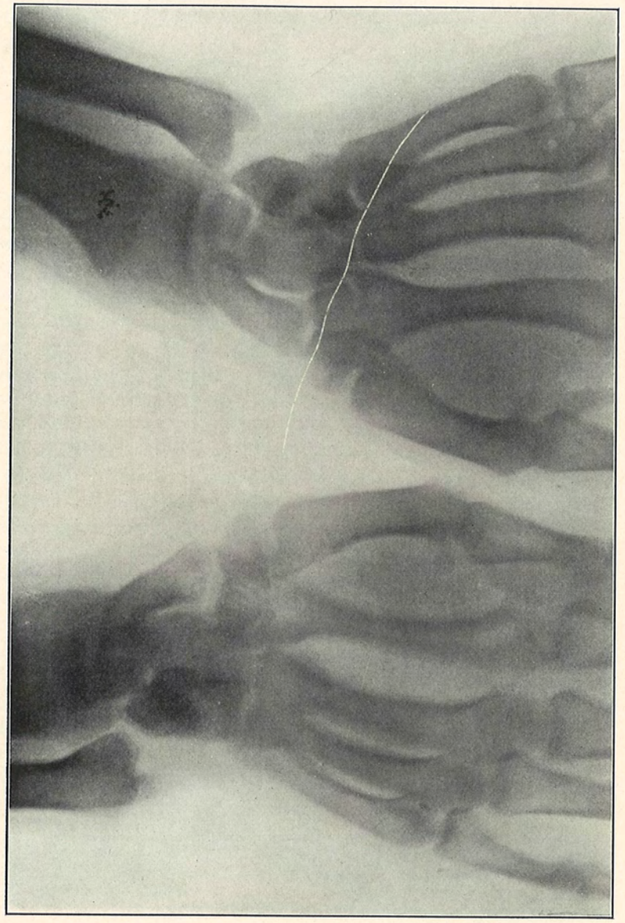


FIG. 3.—Congenital dislocation of both ulnæ; anteroposterior skiagram.

FIG. 4.—Congenital dislocation of both ulnæ; lateral skiagram.

of the anterior and posterior radio-ulnar ligaments. In these cases the ulna slips a little bit out of place and back into place again with a click like a cracking knuckle.

A WELL-PROPORTIONED ANATOMICAL MODEL.

DR. GEORGE MCCLELLAN showed a young man who, from an artistic stand-point, is one of the most perfectly formed men he has ever seen. For many years Dr. McClellan had endeavored to find a man possessing properly proportioned measurements, but from a study of hundreds of living and dead bodies this is the first that answers the requirements. There are so many fads in physical training that all sorts of disproportionate results are seen when men are closely examined. Sandow has developed wonderful strength, but from an artistic view is only a monstrosity. In the man exhibited, the muscles are covered by a normal amount of fat, and only come into relief when exercised, which gives the most perfect form. Dr. McClellan holds that the standard measurement is that when the distance from the top of the head to the soles is eight head-lengths, and this is the only man he has ever found that possesses exactly this measurement. The head-length is eight and one half inches and the body sixty-eight inches. Attention was called to several points showing remarkable symmetry in the various measurements of the body. Between the points of the shoulders is two head-lengths; between the trochanters, one and one-half; between the nipples, one; the trunk is two and one-half head-lengths long; the upper limbs, three; the lower limbs, four. The difficulty in finding a figure that is perfectly developed is not understood by must people, the trouble being that one part, particularly the upper or lower portion of the body, is often well developed, and the others are lacking. The famous statues made 400 to 500 B.C. are all, with possibly the exception of one,—the Resting Mercury,—made as composites.

RUPTURE OF THE LIVER AND LACERATION OF THE RIGHT KIDNEY; RECOVERY AFTER OPERATION.

DR. THOMAS R. NEILSON reported the history of a man, twenty-six years of age, who was admitted to the Episcopal Hospital on June 7, 1902. On the evening of June 4, while standing on a high step-ladder for the purpose of decorating a church,

he lost his balance and fell a distance of some ten feet, striking his right side from the lower ribs to the crest of the ilium upon the arm of a pew. Immediately after the injury he was taken to his home, walking with the aid of friends. The history for the time previous to his admission to the hospital was that there was pain, especially on deep breathing, in the region of the right lower ribs; there was great accumulation of gas in the stomach, and for a time general distention of the abdomen; twice a little blood was vomited; dark-colored urine was voided naturally; there was no evacuation of the bowels, although considerable flatus was expelled.

On admission to the hospital the condition was as follows: The lips and conjunctivæ were blanched; temperature, $97^{2}/_{5}$° F.; pulse, 120, and almost imperceptible; respiration, 24 to 26; chest negative; abdomen, tenderness in upper right quadrant, with marked rigidity of the rectus muscle in that portion; tenderness in axillary line over lower ribs; liver-dulness extends two and one-fourth inches below right costal margin. Once after admission the patient vomited a small amount of blood. About an ounce of bloody urine was voided. A catheter was passed, but no more urine could be obtained. Boric acid solution was injected into the bladder and the whole amount returned clear. The leucocyte count was 12,600.

The indications of hæmorrhage were of course plain. The hæmaturia pointed to kidney injury, but the increased extent of liver-dulness, and the tenderness in the right upper abdominal region with rigidity of the upper part of the right rectus muscle, caused him to believe that the chief injury had been sustained by the liver, and accordingly operation was done with that in view.

Tincture of digitalis, ten drops, and strychnine sulphate, $^{1}/_{40}$ grain, were given hypodermically, and normal salt solution, one and three-fourths pints, was given by hypodermoclysis. The patient's condition was somewhat improved after this.

Through the right rectus, a five-inch incision was made, beginning at the costal border. On opening the peritoneum a considerable amount of dark fluid blood was found in the cavity. The peritoneal and fibrous coats of the liver were greatly distended. The parietal peritoneum in front of the upper pole of the right kidney was torn, and the kidney at this part was found to have been slightly lacerated. No fracture of the lower ribs was found.

An incision through the coverings of the liver was made, and a large amount of dark blood escaped. A considerable quantity of clots was removed by the hand, which on being passed to the posterior border of the right lobe of the liver discovered a rupture of the organ at that position. The region was flushed with hot sterile water, and the bleeding appeared to be arrested.

The patient was then turned partly on the left side, and an incision made between the eleventh and twelfth ribs of the right side just about the posterior axillary line. A long piece of iodoform gauze was then placed in a large rubber drainage tube, the latter being split lengthwise and passed into the abdominal wound, then into the wound made in the serous and fibrous coverings of the liver and brought out through the wound made between the ribs. Another piece of iodoform gauze was packed below the liver and over the upper end of the right kidney and brought out through the posterior wound. The abdominal wound was closed, except around the through-and-through gauze pack, with interrupted silkworm-gut sutures.

The patient did well after the operation, and made steady progress towards recovery. The small gauze pack was removed and replaced one week after operation, and the large one was taken out on the tenth day, being replaced by small iodoform gauze drains inserted into both the abdominal and the posterior wounds, and these were gradually dispensed with. Healing of the wounds progressed favorably.

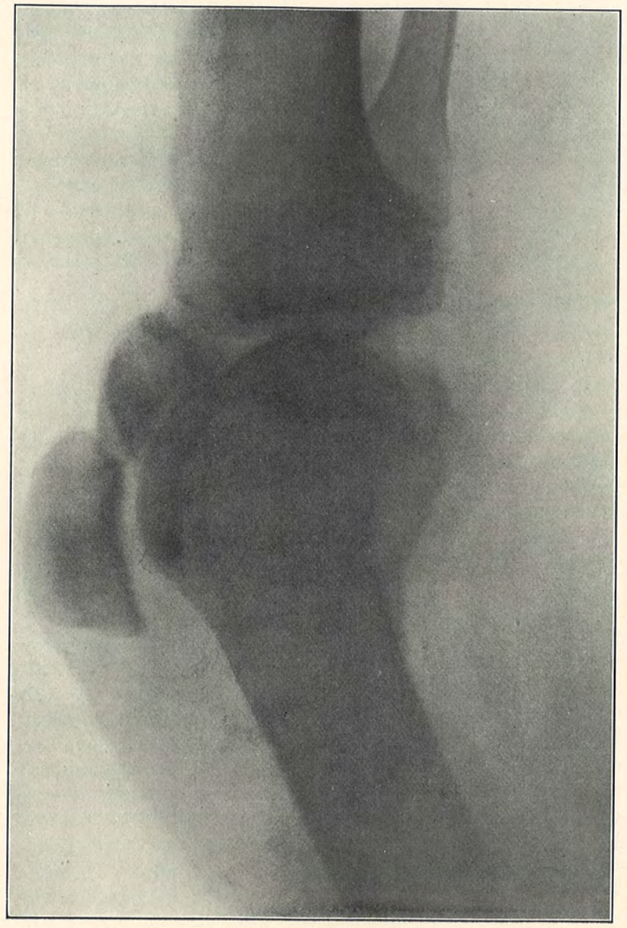
On July 24 the patient was able to get out of bed, and on the 28th, fifty-one days after operation and fifty-four days after the injury, he was discharged recovered.

Dr. De Forest Willard said that about two years ago he had operated on a case of ruptured gall-bladder. The patient was a child who had been crushed by a wagon wheel, but, as it was not seen until two months after the injury, it was uncertain whether the liver had also been ruptured. The extravasated blood and bile had been walled off from the peritoneal cavity, and from this cavity he had removed sixty-four ounces of almost pure bile. (*New York Medical Journal,* lxxv, 369.)

Dr. G. G. Davis related the case of a man who received a blow in the right side, which was followed by acute symptoms consisting of intense pain and abdominal rigidity. There was also dulness in the flanks. Rupture of the liver was suspected

and median incision above the umbilicus was made. Blood gushed forth when the peritoneum was opened, and search revealed that it came from between the liver and diaphragm. This space was tightly packed, but the man died soon after from shock. Autopsy showed a rent four inches long in the upper surface of the liver near its ligamentous attchment.

Dr. John H. Gibbon referred to a case which came under his care at the Bryn Mawr Hospital, which in many ways resembled Dr. Neilson's case, and which at first was thought to be one of rupture of the liver, but which on operation proved to be a rupture of the spleen. The patient was a boy who fell from a tree on Friday afternoon. In a short time he recovered from the immediate shock of the fall and said nothing about the injury when he arrived at home. The following morning, however, he was found very much shocked. He was admitted to the hospital on Saturday, but it was thought at this time he was too ill to be operated upon. Dr. Gibbon saw the patient first on Sunday afternoon. The patient presented every symptom of severe intra-abdominal hæmorrhage. His pallor was marked, his pulse was rapid and weak, and his respirations very much increased. Examination of the abdomen revealed no particular point of pain, tenderness, or rigidity. The abdomen was somewhat distended, with a dull percussion note in both flanks when the patient was recumbent. When the child was turned over on his side, the upper flank became resonant and the dulness of the other greatly increased. There was no evidence of confined blood in either kidney region, nor was there any tenderness here. The patient's urine showed considerable macroscopic blood on the day of admission, but this had become much less when he was seen on Sunday. There seemed little doubt that the kidney was involved in the injury, but at the same time it was clear that the abdomen contained a large amount of free blood. Although the child's condition was very bad, it was deemed wise to open the abdomen and attempt to arrest the bleeding. In the absence of any particular indication, it was thought that the liver was the most likely organ to be lacerated, and therefore an incision was made on the right side of the abdomen below the costal border. A quantity of free blood escaped when the peritoneum was opened, but the liver and other organs on the right side were uninjured. The blood appeared to come from the opposite side of the abdo-



Fragment of bone in cavity of knee-joint.

men, and therefore a second opening was made below the left costal border. The descending mesocolon and the peritoneum over the kidney were markedly injected with blood. When exploration was carried upward, clots were discovered, and later a laceration of the spleen, which admitted three fingers. The wound was firmly packed with gauze, the abdominal cavity irrigated with hot salt solution, and the wound on the right side closed. When these procedures were completed, it was found that the packing had thoroughly controlled the bleeding, and therefore it was left in position and the wound partially closed. The patient made an uneventful recovery, excepting for a slight left-sided pleurisy with some effusion, from which, however, he rapidly recovered.

REMOVAL OF A LARGE LOOSE PIECE OF BONE FROM THE KNEE-JOINT ONE YEAR AFTER BEING RUN OVER BY A FREIGHT-CAR; FUNCTIONAL RECOVERY.

Dr. H. Augustus Wilson said that he was indebted to Dr. John M. Bertolet, of Reading, for the opportunity of operating upon the case, notes of which he now gave. Dr. Bertolet's radiograph (see Fig.) clearly shows the position of the piece of bone. It is a matter of interest to record the difficulty that was experienced in interpreting this radiograph by the many surgeons who saw it. The majority expressed the opinion that it was a piece torn from the tuberosity of the tibia, the error of which was demonstrated at the time of its removal.

The patient, a man aged twenty-six years, on March 17, 1903, while on a very slowly moving freight train, attempted to step from one buffer platform to the other, in doing which he slipped. In falling, he tried to escape the wheel, but did not succeed, for it passed obliquely over his right knee. The engineer saw him fall, and instantly stopped the engine in time to prevent the second wheel also passing over him, but the right hip was severely contused by the second wheel striking against it. The trousers were badly torn at his knee, but the skin was not broken. The greatest pain was experienced at the hip. He voided bloody urine for several days, and suffered very great pain in the right hip and knee as well as in the back and left thoracic region. He was at this time in a hospital in the interior of the State, where the treatment—the exact nature of which could not be ascertained, but from the patient's account appears to have

been directed principally to the right knee. He remained in the hospital for five weeks, and used crutches for three weeks after dismissal. He was again admitted, and was kept in bed for four weeks because of the severe pain in the back, knee, and hip. Until September, 1902, when he discontinued the use of crutches, he was confined to bed at irregular intervals for periods of a week or two. Not until he attempted to walk without crutches was it noticed that he was unable to fully extend or fully flex his hip and knee, and there seemed to be marked shortening, which was in a large measure due to the lack of ability to extend the leg. He was admitted to the Jefferson Medical College Hospital and operated on on March 9, 1903.

A longitudinal incision five inches in length was made from the lower edge of the patella to about the middle of the tuberosity of the tibia, and immediately upon entering the joint a hard, movable mass was encountered. Efforts at removal very quickly showed that, while apparently movable, it was firmly attached by fibrous bands to the tibia, from which it was dissected. The condyles of the femur were scrutinized, but gave no evidence of having lost any of their contour. The articulating surface of the tibia appeared normal in its anterior and outer aspect, but there seemed to be an irregularity in the posterior inner portion that led to a surmise that the piece of bone had had its origin from there. Subsequent repair had largely obliterated any cavity that may have been made at the time of the accident. The bone when removed was found to have two surfaces that were covered with cartilage and were smoothly polished as though they had been in contact with the patella and condyles of the femur. The firm attachment of the bone to the tibia and its vascularity would seem to indicate that it had formerly been much smaller, but had gradually grown to its present size, which was found to be two inches long, seven-eighths of an inch thick, and one and one-eighth of an inch wide. The wound was closed without drainage. The stitches were removed on the sixth day. There was no temperature. Mild passive motion was instituted on the eighth day and increased daily in extent and duration. On the twelfth day he was permitted to use crutches, avoiding weight bearing upon the affected leg. On the fourteenth day he walked without crutches, with very nearly full normal flexion of the knee, but with incomplete extension. There has been no severe

pain in the joint nor swelling since the operation, and on the fourteenth day he was discharged from the hospital. He was again seen two weeks later, when the function of the joint was almost complete, lacking only the ability to fully extend the knee-joint.

The very unusual amount of traumatism to which the joint was necessarily subjected in the operation of removal of the piece of bone gave rise to fear that ankylosis would follow. It was for this reason that passive motion followed by active manipulation was instituted early, and weight-bearing encouraged at an earlier period than usual in operations upon the knee-joint. It is evident that the knee-joint is sometimes capable of resisting very severe injury, and the recovery in this case from the traumatism of the accident and from the extensive operation shows that with careful technique the joint may be freely invaded without loss of function. Many writers urge that only smooth steel instruments be inserted into the joints and never the fingers, whether gloved or not, but experience in this and other cases shows that such prohibition is unnecessary. Owing to a radiographic dermatitis over the right hip, it has been found impossible to obtain a satisfactory skiagraph of the hip. The study of a very faint negative by Dr. S. A. S. Metheney at the Jefferson Medical College Hospital, and the conditions around the hip, would appear to indicate an impacted fracture of the neck of the femur with complete consolidation, but leaving a slight limitation to the function. He was able four weeks after the operation to walk and go up and down stairs with only a slight perceptible limp, without pain, and with only the fatigue that would be expected in a leg that had had so little use for a year.

Dr. Henry R. Wharton recalled a case previously reported by him in which, following a compound fracture of both bones of the leg and injury of the knee, the knee could not be completely extended. A skiagraph showed that there was a loose mass in the joint. Several weeks later this mass was removed, and proved to be the inner condyle of the femur, which had been torn off and reversed so that the articular surface was directed upward. Good recovery followed its removal, no inversion or eversion being caused by its absence, and the man being able to walk without crutch or cane.

THREE CASES OF RECOVERY FOLLOWING OPERATION FOR PERFORATION IN TYPHOID FEVER.

Dr. Richard H. Harte read a paper with the above title, for which see page 80.

INTESTINAL PERFORATION PRODUCING PERITONITIS AND OBSTRUCTION THREE WEEKS AFTER OPERATION FOR STRANGULATED HERNIA; RESECTION OF BOWEL; RECOVERY.

Dr. John H. Gibbon reported the history of a woman, aged thirty-five years, who was admitted to the Jefferson Hospital on the night of April 1, 1901, suffering from a strangulated left femoral hernia. The symptoms of strangulation were well marked, there being fæcal vomiting, moist skin, and a weak and rapid pulse. The hernia was large, extending for a considerable distance upward over Poupart's ligament. A curved incision was made along the upper border of the tumor with its concavity downward. The sac was opened and found to contain considerable dark-colored fluid, together with about five or six inches of very dark small intestine. The constriction was divided and healthy bowel drawn down into the wound. Hot water was then used freely for the purpose of re-establishing the circulation in the herniated bowel, and was followed by considerable improvement; but there was one portion which, although it had not lost its lustre, yet its wall was extremely thin, and at one point presented very much the sensation of an ulcer threatening perforation. This, of course, was due to pressure at the point of constriction. After considerable deliberation and the free use of hot salt solution, it was determined to restore the bowel to the abdominal cavity. The sac of the hernia was ligated and removed, and a portion of the pectineus muscle with its fascia was brought up and sutured to Poupart's ligament. The wound was closed with a subcutaneous suture of catgut and a subcuticular one of silkworm gut. The patient made an uneventful operative recovery. The postoperative condition was watched with a great deal of interest for ten days, but after that time it was thought there was little danger of any subsequent trouble from the injured bowel. On the eighteenth day, however, the patient experienced considerable pain and discomfort in the abdomen, but this

was promptly relieved by an enema. She was then comfortable until the twenty-second day, when she again had the same pain and discomfort. The enema was repeated, but the result was not as satisfactory as on the former occasion. To the symptoms of pain and discomfort were soon added those of vomiting, slight distention, more marked on the left than on the right side, and a pulse ranging between 120 and 130. At this time there was entire absence of fever. The abdomen was then opened. As the pain was located on both sides, a median incision was made a little below the umbilicus. On incising the peritoneum, there escaped a thick, light-colored fluid, and when the hand was introduced it discovered a mass of adherent intestine on the right side. This was delivered, and more fluid escaped from the abdominal cavity. The adherent bowel was then separated and about one ounce of thick pus escaped. The portion of bowel which had been herniated was bent upon itself, and the mesentery belonging to another portion was adherent to it, and between these two structures the pus was located. When they were further separated, a perforation of considerable size was found at the site of the former constriction. As a large portion of the bowel was deprived of its peritoneal coat in the process of separating the adhesions, it was determined that resection of the diseased portion of the bowel and end-to-end anastomosis would be the best treatment. This was accomplished without difficulty with the aid of the O'Hara forceps. Three rows of sutures were employed,—the first of silk and the last two of catgut. The portion of bowel removed measured about eight inches. A large portion of the intestine was covered by flakes of lymph, and the pelvic cavity was found to contain considerable fluid of a dirty color. The entire small intestine was drawn out of the abdominal cavity and all of the deposits of lymph were carefully wiped away with gauze sponges, and the abdominal and pelvic cavities thoroughly and for a long time irrigated with warm, normal salt solution. The intestine was then returned to the abdomen and the wound closed, except for a small space in its centre, through which a gauze drain was passed down to the seat of anastomosis. The patient was considerably shocked by the operation, and not only required hypodermic and rectal stimulation, but also the use of the intravenous injection of salt solution. During the night following the operation the patient vomited at frequent intervals.

The rectal tube was introduced repeatedly and considerable fæcal matter and flatus passed through it. The next day the patient was much better, and from this time on made a rapid recovery. She was heard from within the past few months, when she had had no recurrence of the hernia and no symptoms of obstruction.

Dr. Gibbon recalled the fact that Dr. T. S. K. Morton reported before this Academy in May, 1901 (ANNALS OF SURGERY, Vol. xxxiv, 1901, p. 318), the case of a woman upon whom he operated for a strangulated femoral hernia, who developed marked symptoms of obstruction of the bowel several weeks later. The abdomen was opened and the bowel resected, the patient making a good recovery. The obstruction in this case was entirely due to adhesion of the bowel.

In the *Lancet* of April 27, 1901, Barker reports a case in which he resected thirty-seven inches of small intestine four months subsequent to an operation for strangulated hernia. In this case, at the time of operation, the strangulated bowel was not gangrenous, although considerably congested. Subsequently the patient suffered from two attacks of severe obstruction. At the time of the second operation there was found extensive adhesion of the intestine, with nearly complete obstruction of its caliber due to a kink. The patient made a good recovery.

Both of these cases differ from the case reported by Dr. Gibbon in the important respect that there were no abscess, no perforation, and no peritonitis present in either; but nevertheless they all illustrate the occasional necessity for opening an abdomen for obstruction a number of weeks after operation for strangulated hernia.

He added that while it was not his purpose to discuss the immediate treatment of the bowel in strangulated hernia, he desired to say, however, that it was his own practice, when the circumstances permitted of it, always to operate at once upon cases of strangulated hernia and never to employ taxis. He was also of opinion that when there is great doubt as to the vitality of the bowel, the surgeon will display better judgment by doing an immediate resection than by restoring the bowel, temporarily fixing it in the wound, or performing an artificial anus. Of course, cases which are moribund are not included in this statement.

The point which each of the three cases already quoted emphasized was that, when symptoms of obstruction of peritonitis

develop after an operation for strangulated hernia, immediate opening of the abdomen is demanded. Delay at such a time is disastrous, and early operation gives wonderfully good results, even under the most discouraging circumstances.

DR. FRANCIS T. STEWART briefly reported two cases of intestinal resection. One followed a previous operation, by another surgeon, for strangulated inguinal hernia in which resection had been performed. The obstruction necessitating the second resection in this case was caused by a diaphragm made by the O'Hara forceps, which was used in the first operation. This patient died. The second patient is now convalescing from a resection made necessary by the results of an ovariectomy performed some months before. Obstruction was due to a kink in the bowel. A perforation was found at the site of kinking. This was sutured and the abdomen closed. In three weeks symptoms of obstruction again developed due to the formation of a stricture at the point of suturing. The stricture was resected without mechanical aid.

DR. GIBBON, in closing, said that the first case referred to by Dr. Stewart was one that he had operated upon, the obstruction being due to a diaphragm following the use of the O'Hara forceps. He has entirely given up the use of these forceps and unites the intestines without mechanical aid.

THREE SUCCESSFUL LAPAROTOMIES FOR INTESTINAL PERFORATION IN TYPHOID FEVER.

BY RICHARD H. HARTE, M.D.,

Surgeon to the Pennsylvania and Episcopal Hospitals; Consulting Surgeon to St. Mary's, St. Timothy's, and Bryn Mawr Hospitals.

I WISH to report briefly three cases of perforation of the intestine following typhoid fever which were operated upon and recovered. These three cases occurred out of a series of thirteen in my service at the Episcopal and Pennsylvania Hospitals.

CASE I.—December 4, 1900, Episcopal Hospital. Male, aged twenty-nine years. Perforation in the third week of the disease. Since being in bed has had some sharp pain in lower abdomen. At 11 A.M. had a sharp, severe pain in the hypogastrium immediately after using the bedpan. Two hours later had a severe chill, after which the pulse became rapid and weak. The abdomen was hard, rigid, tender, and painful. I saw the patient in consultation about that time and advised immediate operation, but, owing to delay in obtaining permission from his family, he was not operated upon until five and one-half hours from the time of perforation.

Operation.—Ether. Incision along the right rectus muscle. On opening the abdomen a large amount of turbid fluid escaped; intestines and omentum red and congested; appendix adherent but not perforated. After the withdrawal of a number of coils of ileum, a small perforation was found about ten inches from the cæcum, apparently the centre of a Peyer's patch that was ulcerated, and which was easily closed with silk. A small amount of fæcal matter had escaped, which was easily washed off with hot salt solution. After the abdomen and pelvis were thoroughly douched with normal salt solution the intestines were replaced. A glass drainage tube was carried well down into the pelvis, and the wound partially closed. The appendix was removed. Temperature, $103^{3}/_{5}$° F.

The convalescence was slow. In about three weeks the

wound was closed. A week later the patient developed an empyema, which necessitated the introduction of a large drainage tube into the pleural cavity. Cultures from pus showed colon bacilli, streptococci, and bacillus fœtidus. The patient rapidly recovered, and was discharged cured eighty-three days after operation for typhoid perforation.

CASE II.—Male, thirty-nine years of age. Pennsylvania Hospital. Admitted May 4, 1902. Had been sick for about ten days. On admission presented symptoms of peritonitis. Abdomen was tender and board-like. As soon as possible the patient was prepared for operation. Under ether, incision was made on edge of right rectus muscle; on opening abdomen about two pints of lemon-colored fluid escaped with flakes of lymph. Appendix much swollen and congested and was removed. Some distance from the cæcum a perforation was found in the ileum, which was closed with two rows of Lembert silk sutures. Much fæcal matter had escaped. The abdomen was flushed out with hot salt solution, followed with equal parts of normal salt solution and hydrogen peroxide, and finally with normal salt solution, being then packed with five large pieces of gauze and the wound left open. On the third day after operation the packing was removed. The condition was good; abdomen flat. The gauze was replaced. Two weeks later temperature was normal, wound clean, but not healed. When apparently convalescent, the patient had a typical typhoid relapse, and was removed to the medical ward, where he had a second relapse two months after admission. He was discharged cured three months after operation, with slight ventral hernia.

CASE III.—Male, aged thirteen years. Pennsylvania Hospital. Operation, May 11, 1902. Patient was admitted to the medical ward with typhoid fever on April 4; present illness began on March 28. Ten days before admission had had headache, backache, cough, epistaxis, and diarrhœa. On admission, spleen was enlarged, abdomen soft and flat, temperature high. On the forty-sixth day of the disease the abdomen became distended and tender, with great muscular rigidity, although there was no marked evidence of any sudden perforation. Operation was advised, although the patient's condition hardly warranted surgical interference. Ether. Rigid cyanotic abdomen, with intense tenderness, rapid dicrotic pulse, and cold extremities. Incision on right side permitting the escape of about half a pint of straw-

colored fluid and flakes of lymph. Appendix found in an ounce of pus, gangrenous and perforated, and was ligated and removed. On examination of the ileum, two perforations were found with some escape of fæcal matter, and closed with silk sutures. Abdomen and bowel irrigated with hot salt solution, then with equal parts of salt solution and hydrogen peroxide, and finally with normal salt solution. Abdomen packed with large pieces of gauze; wound left open.

The convalescence was protracted and interrupted by two distinct relapses. The patient was finally discharged cured over three months from time of operation. Abdominal wound quite firm.

In reviewing these three successful cases, it will be noticed that they represent one from each of the three classes that are ordinarily brought to the surgeon's notice for operation. In the first one the perforation occurred during the middle of the disease with the patient in good condition, and was immediately recognized and operation advised. The only delay which arose was waiting for the consent of the patient's family, during which time the patient lost considerable ground. The second was of the ambulatory character, coming on suddenly in a patient who was not much exhausted from the effects of the disease, and presenting many of the characteristic symptoms of an acute appendicitis with perforation. This class is decidedly the most favorable for operation, and from it the greatest number of recoveries will be gathered. The third class is the most unfavorable, as the vital energies are almost entirely exhausted as the result of a prolonged and exhausting disease; and it is in these cases that the greatest difficulty is experienced in arriving at an accurate diagnosis whether perforation really does exist or not. Nevertheless, this third class illustrates how ill a case can be when operated upon and yet recover.

The key-note of success in dealing successfully with typhoid perforations is the early recognition of the lesion. At the best this is a most difficult procedure, and the diagnosis can best be made by the medical attendant who has carefully

followed the case from the beginning, noticing all the trifling changes that occur in the abdomen. When any undue symptom arises, the surgeon should immediately be consulted, and with his aid and the carefully acquired knowledge of the medical attendant a correct diagnosis can generally be made. The classic symptoms of perforation when well marked can hardly be mistaken, such as pain, tenderness, rigidity, shock, chill, facial expression, and all the symptoms of peritonitis. To make an accurate diagnosis of perforation in the early stage, the medical attendant must be thoroughly conversant with the condition of the abdomen, and must be alert for the first symptom of muscular rigidity, which is one of the earliest and most important signs of intraperitoneal irritation.

Rigidity and spasm are terms so loosely used and so difficult of apprehension that it is not easy to reconcile oneself to these recorded statements. I believe that rigidity as understood by the surgeon differs from that interpreted by the physician, and, as just stated, is most difficult to properly estimate its significance in many cases; but if this sign is rightly interpreted, it is the key-note to the early detection of a perforation in a large proportion of cases. The ideal method would be for the surgeon to see regularly, in conjunction with the physician, all cases of typhoid fever day by day. The leucocyte count has proven of very little value at the time when most needed.

Cases with hæmorrhage are most perplexing, as these two conditions—hæmorrhage and perforation—may exist together, although they did not occur in my series. The absence of liver-dulness and the presence of flank-dulness are late signs, and are of little corresponding value. The facies is of value if carefully noted by the person in attendance, but is difficult to read by a stranger until peritoneal involvement is very marked.

Shock is regarded by some as an important symptom, and is undoubtedly present if sufficient time is allowed for its development. No time should be wasted hoping that reaction will take place, for as every hour passes the greater will be the leakage from the intestine, causing greater soiling of the peritoneum. Immediate operation will enable us to prevent further

soiling of the peritoneum, to repair the injury to the bowel, and reduce the danger of septic inflammation by suitable toilet followed by drainage, and also combat the existing shock and aid reaction by douching the abdominal cavity with hot salt solution.

Immediate operation should be urged even in the presence of profound shock, as every hour of delay proportionately decreases the chances of recovery.

The incision is preferably made on the right side, and is almost sure to lead down to the seat of perforation, which is always within a short distance of the cæcum. In hunting for the perforation, it is a good rule to start with the cæcum and appendix; then the last three or four feet of the ileum are examined, and as much of the ascending colon as can be exposed. If no signs of peritoneal infection are recognized during this examination, an error in diagnosis has been made, and further operative interference should be discontinued. If, however, signs of peritonitis are apparent, and the cause is not detected, a median incision should be made so that the entire length of the colon and the remaining small bowel can be carefully examined. A perforation may be easily hidden from sight by a piece of lymph, therefore all portions of the bowel that are indurated or covered by lymph should be carefully examined. It is safe to say that the lateral incision will be found the most satisfactory in 95 per cent. of cases operated upon. Out of 332 cases which I have carefully analyzed, in ninety-six the median incision was made with a mortality of 78.12 per cent. In the right lateral incision there were 123, with a mortality of 68.37 per cent. In the other cases operated upon, the site of incision was not mentioned. The more improved technique has undoubtedly reduced the mortality in these operations, which will be noticed in the appended table.

TYPHOID PERFORATION.

Recovered, 87; died, 245; total, 332; mortality, 73.79 per cent.

Operations.	Recovered.	Died.	Total.	Mortality.
1884–1888.....	1	9	10	90 per cent.
1889–1893.....	2	14	16	87.5 per cent.
1894–1898.....	28	82	110	74.5 per cent.
1899–1903.....	45	101	146	69.1 per cent.

In fifty cases, year of operation not stated.
Mortality for male sex, 78.5 per cent.
Mortality for female sex, 61.4 per cent.

When the perforation has been found and its closure will not produce too great stenosis of the bowel, it should be rapidly closed with silk sutures in whichever direction, either transversely or longitudinally, to the lumen of the bowel which produces the least narrowing of the gut. No time should be wasted on attempting to trim or freshen the edge of the ulcer, as the area of the bowel near a perforation is always so friable that stitches are liable to tear out. The best stitch for this purpose is the so-called mattress suture, as a running Lembert is liable to cut or tear through the friable tissues. When the opening is closed, the bowel should be carefully inspected for other perforations, as not infrequently these openings are multiple. Often dark necrotic spots will be found where the ulcer has destroyed the coats of the bowel down to the peritoneum, giving the appearance that in a short time another opening would be formed. All such suspicious places should be treated as though a perforation had taken place, and the weakened area fortified by being folded in with stitches. Occasionally, cases will be met with where the opening in the bowel is too large or the area inflamed too great, so that closure is not practicable. When this condition exists, there are four procedures offered. First, a plug of omentum may be so fashioned and stitched against the opening in the bowel as to form a simple patch, after the manner in which Nature sometimes deals with these conditions. Second, resection of the

bowel and an end-to-end anastomosis either with stitches or with a Murphy button, the latter being much more rapid. Third, the formation of an artificial anus by stitching the bowel to the abdominal wall, and, fourth, cutting off the damaged area of the bowel from the general peritoneal cavity by carefully placing pieces of gauze between the folds of the bowel.

The cleansing of the peritoneum and drainage are the most important procedures. It has been decided by some that when only the right lower quadrant of the abdomen is infected, the intestine should be brought outside of the abdomen and carefully cleansed with salt solution and gauze sponges, while the cavity within is sponged dry.

My best results have been where the peritoneum has been dealt with by vigorously flushing with salt solution, then with equal parts of salt solution and hydrogen peroxide, and finally douching with normal salt solution. This is best done by carrying a large tube down into the pelvis, and with vigorous flushing all foreign matter can be much more easily removed than by attempts at dry sponging. After the intestines are carefully replaced in the abdomen, a number of large gauze wicks are carried down to the bottom of the pelvis and to the different parts of the abdomen between the coils of intestine, so as to secure good free drainage. Little or no attempt should be made to close the abdominal wound, except it has been unusually large, when a couple of sutures at the upper angle can be introduced. The wound should have a liberal dressing of gauze applied over it, as it will in a short time become thoroughly saturated with fluid from the abdominal cavity through the medium of the gauze drains. These should not be disturbed for three or four days, after which time they can be removed without much difficulty by thoroughly saturating them with salt solution or hydrogen peroxide. They then should be replaced with a fresh gauze pack, which may be of less quantity, according to circumstances.

In reviewing my work in this gloomy field of surgery, I feel convinced that there are two important factors to be carefully considered. First, the early recognition of the lesion and

dealing with it as rapidly as possible, in order that as little time as possible will elapse from the time of perforation until operation has been performed; and, second, that the operation should be so planned, since time is so important an element, that not a moment should be wasted during it, the technique being of the simplest character, as every moment of delay will cause a much higher percentage of mortality.

DISCUSSION.

Dr. G. G. Davis said that Dr. Harte need not feel chagrined over a mortality of 76 per cent. in his operations for typhoid perforation, as the mortality in these cases hinges on the character of the case rather than on the character of the operation. The importance lies not so much in operative technique as in diagnosis. The present high mortality will be lowered only when the physician and surgeon respectively are not afraid to suggest operation and to operate. Dr. Davis had operated on three cases during the past year and all died. All had general peritonitis, but the condition of each after operation was as good as it was before, hence he does not believe that operation *per se* markedly diminishes the chances of recovery. He thought formerly that inflammation of the appendix was not frequent in typhoid fever, but the number of cases he had lately seen show this to be not a rare complication. Some cases showing pain and tenderness over the appendix recovered without operation. In one case operated by Dr. Davis he found two perforations, one in the ileum and one in the appendix. The latter organ, although perforated, did not show marked inflammatory involvement, such as is found in cases of true appendicitis when the appendix alone is diseased.

Dr. D. J. Milton Miller, who made an early diagnosis of perforation in one of Dr. Harte's successful cases, said there was at times no more difficult condition to decide upon than that of perforation in typhoid fever. There are a few signs, however, which, in a certain number of cases, enable one to make the diagnosis early. This is especially true in cases that previous to perforation have had no marked abdominal symptoms. When the latter conditions have been present through the course of the disease, a diagnosis is very difficult to make, and is often first

made in the post-mortem room. Typhoid fever patients should be watched very closely, no symptom being too trivial to be noted. The most important symptoms pointing to perforation are pain, rigidity, and increased pulse-rate. The temperature does not help us much. A rise is just as likely to occur as a fall, and distinct falls are unusual, except late in the attack, when general peritonitis or collapse is present. He had often noticed a fall of two or three degrees, but in looking back over the chart very often many similar variations could be found. The leucocyte count is unreliable. Leucocytosis is not so very uncommon in typhoid fever when there is no explanation for its occurrence. By this is meant a count of 8000 to 10,000. In one case under Dr. Miller's observation the leucocyte count was 10,000 when the patient entered the hospital. It afterwards fell slightly, and was only 9400 at the time of operation for perforation, six days after admission. Of all the symptoms pain is the most important, and the patient is usually able to fix definitely the time of its beginning. Pain during the course of typhoid fever is usually rare, and its onset of the greatest significance. Tenderness in perforation is usually localized in the lower right quadrant of the abdomen. Rigidity is usually present and comes on early. Some increase of the pulse is present in all cases. Dr. Miller does not believe in the so-called preperforative stage. The symptoms ascribed to that stage are really those of the early stage of perforation.

Dr. J. P. Hutchinson said he believed that if the records of general hospitals were examined it would be found that the majority of cases of perforation saved by operation were among those patients that came into the receiving ward and were operated on at once. Three of his successful cases were from the receiving ward, and in all there was an element of doubt as to the exact condition present. There was no difference in their condition externally from cases of perforation in hospital wards. These statements regarding receiving ward cases are based on the fact that there are different rules for visiting surgeons and visiting physicians, the latter having fairly definite visiting hours at the hospitals, the former being accustomed to go whenever they are sent for. Hence, with medical ward cases there is apt to be some lapse of time after a change in symptoms, unless they are very pronounced, before the patient is seen by the chief.

With receiving ward cases the resident surgeon perhaps makes a diagnosis, or at least sends at once for the surgeon. Most of these cases should be operated upon even if there is an element of doubt. Dr. Hutchinson has opened two cases which were doubtful and found no perforation. One was supposed to be appendicitis, but proved to be typhoid fever. In that one there was marked improvement for two days after the operation. Operation *per se* does no marked harm. In closing perforations, the longitudinal method of suturing is the better. In every case where the speaker has tried to reinforce the sutures, there has been escape of fæces.

Dr. W. L. Rodman said he coincided with Dr. Harte's statement that the incision should be made on the right side, although in his own case the median incision fortunately was made directly over the perforation. As little time as possible should be spent in the operation. The continuous suture for closing the perforation is less effective than the Lembert with packing around the area to protect in case of giving away. In doubtful cases gauze may be sutured over the wound with catgut as practised by Mayo. The diagnosis is not always easy. He operated one case which two medical men pronounced perforation, but which he thought was a case of hæmorrhage. The latter diagnosis was found to be the correct one. The patient recovered from the operation and died later from a second hæmorrhage. This case was operated upon under local anæsthesia produced by carbolic acid. No pain was experienced by the patient except when the parietal peritoneum was handled. A second case in which carbolic acid anæsthesia was used was one of strangulated hernia. No pain whatever was caused by manipulation of the intestines, but there was some, as in the first case, when the parietal peritoneum was handled. Flushing of the abdominal cavity in perforative cases is better than wiping. It saves time and more thoroughly gets rid of sepsis. The solution should be as hot as can be borne. Dr. Rodman is interested in the question of a preperforative stage. He thinks there is such a stage, but it cannot be recognized with sufficient certainty to warrant laparotomy in all instances. When so much difficulty is experienced in diagnosing perforation itself, how is the preperforative stage to be recognized? In his own case he believes there was such a stage, showing itself twenty-four hours before the perforation. There

is much in this suggestion of Cushing, and, if possible, the surgeon can at least get ready for operation; if there is a probability of perforation, he can operate at once under cocaine anæsthesia. He was glad to hear Dr. Harte emphasize the danger of waiting for reaction in these cases. The same rule as for gunshot wounds of the intestines should hold,—operate during shock in both instances. Perforations of the intestine and of the appendix have a different pathology, the small intestine being movable and the large more or less fixed. This same reason makes gunshot wounds of the small intestine more serious than those of the large bowel. Hence there is lessened gravity in appendiceal perforation, even during typhoid fever; there being less shock and sepsis than in typhoid perforation, when the lesion is usually in the small intestine.

Dr. J. Alison Scott believes that statistics of the time of perforation will show that in the majority of cases it occurs earlier in the course of the disease than the surgeon anticipates. He finds that many cases occur as early as the fourteenth or fifteenth day. He would explain the good results from receiving ward cases mentioned by Dr. Hutchinson by the fact that these are mild and practically walking cases. Such are in comparatively good condition and have a higher peritoneal resistance. They will get well. In cases with marked distention and pain throughout (and he finds that pain is a common symptom in typhoid), the toxæmia is great and the diagnosis of perforation is difficult. In these patients it is often impossible to make the diagnosis early. In 165 cases of typhoid under his care this winter there were three cases of perforation. All were operated upon and all died. Three things are of prime importance in diagnosis,—pain, rigidity, and tenderness. In six of eight cases of perforation coming under his knowledge pain was very sudden in onset. As a rule, it is paroxysmal. In three cases there was a chill. The temperature is of decided importance. In four of the eight cases studied it rose, fell gradually, and then rose again, the pulse meanwhile going up. Rigidity alone is not of so much importance, as it may be present in cases of pleurisy and pneumonia. The leucocyte count is not of great importance. It is usually from 4000 to 5000 in cases of typhoid, but it may jump to 6000 or 8000 at times. A differential count, if the physician has time for it, may be of value in some instances. In the Johns

Hopkins Hospital hæmorrhage with perforation has been frequently noted. Dr. Scott has not seen this combination, as in none of the cases of hæmorrhage seen by him has there been perforation; other observers have recently, however, seen the combination of the two.

Dr. R. P. McReynolds gave brief notes of four cases of perforation that he had operated upon. The first was operated upon four days after the perforation; a localized abscess had formed upon the right side; this was opened and drained. The man made a complete recovery.

The second case was operated upon about eight hours after perforation; a large opening in the bowel (the size of a twenty-five-cent piece) was found and closed. The man died some hours later.

The third case was operated upon for appendicitis, but at autopsy it was found that the cause of the general peritonitis had been a perforated typhoid ulcer.

The fourth case was operated upon about twelve hours after perforation. The diagnosis was obscured on account of severe intestinal hæmorrhages preceding the perforation. The gradual increase in the leucocytes was considered of considerable diagnostic value. The boy died about seven hours after the operation.

In these cases the incision was made in right semilunar line; chloroform used for anæsthesia. In three of them cocaine was also injected along the line of incision in order to diminish the quantity of chloroform necessary for anæsthesia.

The first case shows the possibility of a localized abscess forming after a perforation from typhoid fever ulcer, just as it does from perforation of the appendix.

Dr. Joseph M. Spellissy briefly detailed a case which he believed illustrated diagnosis in the preperforative stage. In that case there was a sudden rise of temperature, abdominal rigidity, tenderness, and pain. The leucocyte count was negative. Dr. Spellissy saw the patient two hours after the initial symptoms at the request of Dr. T. L. Coley, and agreed with the latter's diagnosis of possible perforation, and operated. Beside the symptoms detailed, there was present some bronchitis, and a slight dulness over the left apex. Operation under ether anæsthesia revealed a patch on the intestine covered by lymph; the

lymph was wiped off, but no perforation was present; although from the appearance of the ulcer it seemed imminent. The affected area was buried by means of Lembert's sutures. There was a free amount of peritoneal fluid, but it was clear. The case terminated fatally in twenty-four hours from pneumonia.

Dr. John B. Roberts said that increase in respiration was an important point. A sudden increase of respirations to 30 or 36, accompanied by pain in the abdomen, probably means perforation.

Dr. Harte, in closing, said that as regards cocaine he had never used it, but believed there was no doubt of its value in the hands of some surgeons. The time of recognition of the condition and the time of operation cannot be too close together, and but little time can be spent in making the toilet, which should be simple but thorough. One must get the patient off the table and into bed if any reasonable percentage of cases are to be saved. No one definite rule as to the manner of stitching the intestine can be followed, as this should be determined by the character of the perforation. It is less apt to tear when closed longitudinally. The leucocyte count is of no value, being only misleading in cases of perforation. Localized abscess is possible only when the lesion is associated with the appendix, as in typhoid fever the peritoneum does not have an opportunity to form well-marked collections of pus, as are noticed in other peritoneal conditions. After operation for perforation, the patient should be nourished by the bowel for a long time. As to the preperforative stage, there are no symptoms in typhoid perforation until perforation itself occurs; then the whole train of symptoms rapidly follow.

STATED MEETING, MAY 11, 1903.

The President, Richard H. Harte, M.D., in the Chair.

A REVIEW OF THREE HUNDRED AND THREE OPERATIONS UPON THE STOMACH AND FIRST PORTION OF THE DUODENUM.

WITH TABULATED REPORT OF THREE HUNDRED AND THIRTEEN OPERATED CASES.

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Functionally the small bowel begins at the entrance of the common duct of the liver and pancreas, which about marks the primitive division between the foregut and the midgut (Huntington). The first portion of the duodenum may be said to be the vestibule of the intestinal tract, and its diseases partake more of the character of those of the stomach rather than the intestine. In the large majority of instances, lesions at this point cannot be diagnosticated accurately from similar diseases in the stomach, and are usually due to the same causes. For this reason I have associated all of the cases of this description into a single group for the purpose of study. Total number of cases, 303. Of these 286 are taken from the records of St. Mary's Hospital, Rochester, Minnesota, and the remainder are from the records of the Minnesota State Hospital for the Insane at Rochester and St. Peter. The average age was forty-two; males, 42 per cent.; females, 58 per cent.

Duodenum, twenty-six cases, two deaths, 7.6 per cent. Lesions of the first portion of the duodenum can be divided into two groups; first, those due to ulcer, and, second, those associated with gall-bladder disease.