will be of the utmost importance, and too great care cannot be given to this procedure.

If there is any question in the mind of the surgeon as to his ability to close the perforation, a small packing of iodoform gauze may be left in around the sutures and allowed to remain forty-eight hours; but this is rarely necessary if careful and systematic suturing with two or three rows of carefully introduced sutures has been resorted to. It is needless to say that the mortality in this condition is very great, the percentage of recoveries being exceedingly small. In perforating gastric ulcer, according to the paper published by Weir, the mortality was 78 per cent., the patients dying invariably of shock or peritonitis.

TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, October 1, 1900.

The President, DE FOREST WILLARD, M.D., in the Chair.

DISLOCATIONS OF THE TOES.

DR. GWILYM G. DAVIS reported the following case: Miss A., aged thirty-six years, rather stout, while jumping from a carriage to the ground felt a pain in the forward portion of her right foot. She thought she had sprained it, and kept off her foot for a few days, and then began walking about, though it still pained her. Her physician examined the foot, but could discover nothing but a sprain. Walking continued painful, and eleven weeks after the reception of the injury she consulted Dr. Davis. On a casual examination there appeared to be little except a tenderness to pressure on the metatarsophalangeal joint of the middle toe of the right foot. On more careful examination it was seen that when the foot was placed on the ground the affected toe was separated from the adjacent ones by a slightly greater space than appeared natural or when it was off the ground. On feeling for the head of the metatarsal bone in the sole of the foot it felt a trifle, but only a trifle, more prominent than the others. On following down the metatarsal bone on the dorsum of the foot the region of the phalangeal joint did not appear so clearly outlined as did those on each side; there seemed deeper sulcus at this point than there ought to have been. Pain on pressure was most marked over the head of the metatarsal bone in the sole of the foot. There was no apparent shortening of the toe. These signs and symptoms were such as to cause him to form the opinion that a dislocation was the cause of the trouble, and this diagnosis was confirmed by the X-ray.

The character of the injury having been ascertained, attempts

at reduction were made, but proved so painful that cocaine was injected, and by forced manipulation the toe was brought into place. It was found impossible, however, to keep the toe in place, so ether was administered, and the extensor tendon, that seemed to be the main agent in causing the dislocation to recur, was divided and the phalanx again replaced.

A plantar splint was applied with a pad extending as far forward as the heads of the metatarsal bones. The affected toe was then flexed firmly over this pad and bound down with adhesive plaster to the splint beneath. The toe was kept in this position for about a week and then the splint was removed, and the patient began walking. In about ten days she stated that the toe was again out of place. She resumed her occupation as nurse, and while she at times had some pain, still, it was not sufficient to cause her to lay up, and she soon afterwards left the country.

Dr. Davis added that he felt sure that both an ordinary fracture and sprain at the end of eleven weeks would be practically recovered from, and that the persistent disability was due to a displacement of some sort which was still present, for in cases of sprains, and of small joint dislocations which have been properly reduced, almost or quite perfect function is restored in a comparatively short time if use is made of the injured member. This is seen in the injuries to the finger-joints so common in ball-players. In fractures, also, union in fair position is usually followed by quick restoration of function.

As to treatment, the case shows that old dislocations of the toes are just as unsatisfactory to treat as old dislocations of the larger joints; also that in some cases, at least, it is almost impossible to prevent the dislocation from recurring, and that simple division of the extensor tendon and replacement are not sufficient.

The question of treatment still remains to be solved. Should another case of as long standing as the present one present itself for treatment, he would be inclined to adopt the following course: Etherize the patient, lay open the joint from above, divide the capsule freely, and also one or both tendons, so as to replace the luxated phalanx into position, and leave it there resting loosely in place without any muscular or ligamentous attachments which might tend to displace it. That this would produce a stiff joint is

not likely, if suppuration was avoided and use of the part early resorted to. If it was desired at all hazards to surely relieve the patient at once of his disability, he would amputate the toe and not attempt a resection. Resection of these joints, done usually on the fourth toe for metatarsalgia, has not been altogether satisfactory; control over the toe is lost, and sometimes it overrides its neighbors and gets rubbed by the shoe; while at others it gets caught beneath them and becomes very painful; in either case it becomes a nuisance which may demand removal. This is the experience of Dr. Thomas G. Morton, who has said that he now prefers amputation to resection for cases of metatarsalgia.

OPERATION IN THE PREPERFORATIVE STAGE OF TYPHOID.

Dr. Robert G. Le Conte detailed the history of a colored man, aged twenty-three years, who was admitted to the Pennsylvania Hospital, December 23, 1896. He had been well and at work until three days previous to admission, when he began to have pain in the pit of his stomach, with constipation of his bowels and loss of appetite. The pain soon shifted to the right iliac region and became very severe and constant. He had chilly sensations with fever, but no vomiting, headache, epistaxis, or pain in the back, and none of the prodromic symptoms of typhoid fever. On admission, temperature was $102^{2}/_{5}^{\circ}$ F.; pulse, 88; respiration, 20. Tongue heavily coated all over, not tremulous. Specific ulcer on the left arch of the palate. Heart, lungs, and urine negative. The abdomen was distended and tympanitic; the right abdominal muscles much more rigid than the left; exquisite tenderness over the iliac fossa, with a small, easily palpable tumor which was dull on percussion. No enlargement of the spleen was demonstrable.

With the above symptoms and a history of sudden onset, a diagnosis of appendicitis was made, and immediate operation advised. The patient was etherized, and the abdomen opened over the tumor to the outer side of the semilunar line. Serous fluid with flakes of lymph immediately escaped. The last six or eight inches of the ileum were sharply bent on itself and glued together with recent adhesions. These adhesions were broken up, and this portion of the ileum with the cæcum and part of the ascending colon were delivered through the wound. This portion of

the bowel was highly inflamed, deeply congested, and covered with lymph. On washing away the lymph, some six or seven spots were seen, about the size and shape of a small olive, purple in color, with bluish-black necrotic centres. These necrotic areas were on the cæcum and ascending colon as well as on the ileum, and were on the portion of the bowel opposite to the mesenteric attachment. They were unquestionably necrotic Peyer's patches that had ulcerated through to the peritoneum. The appendix was normal except for its peritoneal coat, which had become infected from the neighboring inflammation. It was evident at a glance that if the bowel was returned in such a condition perforation would speedily take place and peritonitis and death follow.

Three methods of procedure presented themselves: (1) Invaginating the necrotic areas with sutures. This was not attempted for fear the sutures would not hold in such a diseased state of the intestine, and if they did hold, that stricture of the gut would result. (2) A resection of the damaged area, some eight inches of the ileum, the cæcum, and part of the ascending colon. This was rejected, owing to the patient's condition not warranting such a radical procedure. (3) Packing off with gauze this area of the intestine from the general abdominal cavity. This was done, and at the same time the appendix was amputated, on account of its damaged peritoneal coat and the fear that it might cause further trouble. Two sutures were placed in the upper angle of the wound, while the ends of the gauze packing filled up the rest of the incision. The temperature following operation was normal, but it speedily rose to $104^{1}/_{5}°$ F. The pulse, however, was of good character, and at no time exceeded 120. Thirty-six hours later very offensive pus and fæcal material were discharged from the wound. Ten days later the fæces began to lessen in amount, and within four weeks of the operation the fistula had entirely closed. In the mean time the patient developed a typical typhoid condition. His tongue became tremulous; the edges cleaned off, sordes developed, mental hebetude appeared, emaciation was rapid, the bowels were loose, and tympany persisted. The blood was twice subjected to the Widal test, and responded both times. The temperature for twenty days varied from 101° to 103°, when it gradually dropped to normal, and then became slightly subnormal. From this time on the convalescence was uneventful, and he rapidly gained the weight he had lost. He was discharged from the hospital in good health fifty days after admission.

Dr. Le Conte called attention to the early date at which perforation may occur in typhoid fever, and also to the fact that in anomalous cases of enteric fever the diagnosis from appendicitis cannot always be made.

Dr. G. G. Davis remarked that the case was so close to one of perforation as to be practically one of perforation. It furnished data as to how long a patient may be in recovering, provided packing is resorted to and a fæcal fistula ensues. There is no doubt that in some of these cases there is not time to perform an ideal operation, in other words, to close the perforation; the chances of the patient's recovery will be enhanced by treating the case as did Dr. Le Conte,—isolating the infected area and draining rather than invaginating and suturing. He believed it to be a fact that typhoid-fever patients stand operation very much better than is usually supposed or than one might expect. If surgeons resort to operation as readily as some advise, attempting the diagnosis of the preperforative stage, no doubt they will operate occasionally and not find a perforation. He had done so in one case. He reported three cases in the *University Medical Magazine* a few months ago, and in one of them there was no perforation found; yet that patient improved very markedly. There was some evidence of peritonitis, and the operation appeared to benefit the patient very markedly. Therefore, even if one does not find a perforation, the operation will probably be of benefit to the patient.

SHOT AS A NUCLEUS OF VESICAL CALCULUS.

Dr. Robert G. Le Conte said that a man, twenty-six years of age, was admitted to the Methodist Hospital, April 26, 1896, with the history that while rabbit shooting, four and a half years previous to admission (November, 1891), his companion's gun was accidentally discharged, and he received most of the charge in his left thigh and hip. Two days later he passed fourteen shot with his urine. As a result of the injury, he was in bed five weeks. He was then perfectly well for nearly four years, when he began to have frequent urination, with some pain across the abdomen and in the pelvis. Gradually the symptoms of stone developed, *i.e.*, pain referred to the end of the penis, pain on

jarring motions, blood at the end of urination, sudden stoppage of the stream, etc. The passage of a sound revealed a small movable stone. Two days after admission, the patient was etherized and litholapaxy performed. A shot, about No. 6 size, came away with the washings from the bladder. The fragments of stone collected weighed 120 grains. The patient returned home on the third day, relieved from all symptoms.

Dr. George G. Ross mentioned the case of a young man, eighteen years of age, who, having symptoms of stone, was subjected to litholapaxy, and in withdrawing the small crusher a piece of leather shoe-string encrusted with small particles of stone was found in its jaws. It was thought that all the stone had been removed. He, however, redeveloped symptoms of stone, and was operated on again through the perineum, and seventeen inches of shoe-string were removed.

Dr. W. G. Porter said that some years ago he removed a stone from the bladder of a man, the nucleus of which was a twig of a tree. The patient's story was that he had a stricture of the urethra, for which he was occasionally required to use a catheter. On one occasion, when away from home in the wilderness, beyond the reach of a doctor and without a catheter, he was suddenly seized with retention of urine. He cut off a twig from a tree, smoothed it down with his knife, and succeeded in passing it into his bladder. When he withdrew it the urine followed it; and he thought at the time that a portion of the twig was broken off and remained in his bladder. Soon after symptoms of stone appeared; and at the time of the operation he had a very tight urethral stricture, which had to be relieved before the stone was removed by litholapaxy.

PERFORATION OF THE SMALL INTESTINE RESULTING FROM THE KICK OF A GUN

Dr. William J. Taylor related that on Saturday, July 28, 1900, a young man of twenty-three was out shooting, using an ordinary double-barrelled shot-gun. This gun was accidentally discharged while he was holding it in front of his body, so that he received a very severe kick from it in the right iliac region. There was intense pain, and he had great difficulty in getting back to his home. Pain and tenderness continued all the next day, and on Monday, the 30th, he was brought to Philadelphia, arriving here

at eight o'clock in the evening, after a journey of five hours. Dr. Taylor saw him immediately on his arrival, and found him to be suffering from general peritonitis, with special pain and tenderness in the right iliac fossa. His temperature was 102° F., his expression anxious, but his pulse fairly good. Within an hour thereafter the abdomen was opened. There was general peritonitis, with masses of lymph here and there over the intestine. Two coils of small intestine were glued together at one small point. This was separated very easily with the finger, no force at all being used, when immediately there was a gush of liquid fæces, and a perforation was seen in the wall of the bowel about the size of a lead-pencil, with ragged, sloughing edges. The lymph from the intestine was carefully wiped off, and there was such gaseous distention that the contents of the gut were milked out of this perforation. The opening in the bowel was invaginated and closed by a double row of silk sutures. A search was now made for the appendix, which was discovered to be post-cæcal and very difficult to find. Its tip was slightly clubbed, and, in view of the possibility of subsequent danger, it was removed. A very careful toilet of the peritoneum was made and a search for further perforations or evidence of ulceration in either the large or small intestine. None, however, could be found, nor any evidence of thickening of the intestinal wall. Drainage was introduced, a wick of gauze wrapped in rubber dam.

He gave a history of not having felt very well for some two or three weeks, and, to eliminate the possibility of his having had a walking typhoid, some of his blood was sent to the city bacteriologist for examination by Widal's method, but a negative report was made. He was profoundly poisoned by the septic peritonitis, and, in spite of every effort made to save him, he died seven days after the receipt of his injury.

Dr. Richard Harte said that this case emphasized the importance of dealing surgically with severe contusions of the abdomen. He was convinced that the results would be much better in dealing with these injuries if the abdominal cavity were opened, in properly selected cases. In four cases of abdominal contusions which had been admitted to the Episcopal Hospital within a short time, in two there were ruptures of the liver and in two ruptures of the intestine, one of which was very much of the same character as the case cited by Dr. Taylor. A man while attempting

to escape from a falling beam fell, and the point of a pair of pliers which he had in his pocket struck the abdomen and made a small puncture, but did not enter the bowel. There was evidence of abdominal contusion. Dr. Deaver opened the abdomen and found a perforation of the bowel, simply by contact with this blunt instrument.

In determining when the abdomen should be opened, he thought that a man's surgical sense had to be relied on to a great extent. There is a class of cases where the element of shock is very noticeable and where the reaction is slow. There is evidently some disturbance going on which demands surgical interference. These cases, if left to themselves, will soon become tympanitic and present all the symptoms of traumatic peritonitis, and will in a short time die; but if they had been opened immediately, and if possible before the shock had become too profound, conditions would be found in many of the cases which could have been dealt with surgically. Of course, there are cases where surgical interference will be of no avail, as in case of rupture of the liver or some of the abdominal viscera; but where there is hæmorrhage, or where the intestine is ruptured, as so often occurs, with or without extravasations of its contents, most favorable results can be obtained in dealing with these cases by opening the abdomen and seeking systematically for the trouble; and the element of risk involved by this procedure in doubtful cases is slight compared with the old method of dealing with these cases.

ENTERORRHAPHY.

Dr. M. J. O'Hara, Jr., presented a specimen that showed an end-to-end anastomosis done after the method he presented at the April meeting. This specimen was removed from a large Newfoundland dog fifteen days after operation; it shows the character of the union obtained, and also the appearance of the gut on the inside. The sutures used on one aspect was the Halstead, on the other a continuous Lembert. His preference was the Halstead, as with this suture he got better approximation and no adhesions to the surrounding structures. The specimen was preserved in Pick's solution. This dog was up and around hunting for something to eat in eight hours; he was fed at once on ordinary dog food, and did not seem to mind the operation in the least. In placing his sutures, he had endeavored to carry them

down to the mucous coat, so that if any hæmorrhage occurred it must be within the bowel. None of the cases that he had observed had any bleeding from the bowel. The operation by his method was a perfectly bloodless one. The larger blood-vessels in the mesentery may cause some annoyance, but wherever it could be done he avoided cutting them.

WOUND OF THE DIAPHRAGM AND STOMACH.

Dr. De Forest Willard read the history of a boy, two and one-half years of age, who fell from a second story window, striking upon a sharp picket fence, and remained fixed upon the paling until removed by his father; the paling was not broken. A large lacerated wound was found in the left upper quadrant of the abdomen, and several feet of intestines immediately protruded from the wound. No injury of the intestines being discoverable, they were returned to the abdomen, and three stitches were inserted by the attending physician in order to retain them in position during the transit of forty miles to the Presbyterian Hospital. The symptoms of shock steadily progressed, so that by the time the reporter saw the child, some five hours after the accident, the pulse was flickering and feeble, and the respiration rapid. His desperate condition was evidenced by the fact that it was possible to operate upon so young a child without an anæsthetic, and with very little complaint of pain.

Upon cutting the stitches, an irregularly horseshoe-shaped tear, four to five inches in length, was found in the abdominal wall, with its base towards the ribs. The intestines immediately protruded. The wound was enlarged with scissors, when it was found that the stomach and a large portion of the intestines had passed into the pleural cavity through a large tear in the diaphragm, readily admitting the entire hand. When the stomach was drawn down, a lacerated wound, one and one-half inches in length, was discovered upon its anterior wall, which was quickly closed with Lembert's sutures and packed off. As there was a large quantity of blood in the pleural cavity, a long probe was passed through the diaphragmatic wound across the pleural cavity, and a large drainage opening made in the posterior part of the thorax, into which a large tube was inserted. The wound in the diaphragm was closed with catgut sutures; the abdomen

was flushed with hot salt solution, and gauze packing introduced around the stomach and in the wound.

Although the child was in a desperate condition at the beginning of the operation, all the manipulations were completed and the child placed in bed; but he sank steadily, and died from the shock.

From the direction taken by the paling, it is probable that the heart itself was badly contused by the point. At the autopsy it was found that the rent in the stomach and diaphragm had both been tightly closed by the sutures, and had not the shock of the accident been sufficient to kill the child, his chances for recovery would have been favorable. The left lung had collapsed.

TRANSACTIONS OF THE PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, November 5, 1900.

The President, DE FOREST WILLARD, M.D., in the Chair.

INFECTION BY THE BACILLUS AËROGENES CAPSULATUS IN AN OPEN FRACTURE OF THE RADIUS AND ULNA.

DR. JOHN B. ROBERTS said that he desired to put on record a case of gangrene of the forearm after an open fracture, which appears to have been due to infection with the gas bacillus.

A young girl, aged twelve years, slipped and fell on August 31, 1900, sustaining a fracture of the left radius and ulna about the junction of the middle and lower thirds. One of the fragments of the ulna made a small wound through the skin. Dr. J. H. Hardcastle, who had charge of the case, cleansed the wound with soap and water and solution of corrosive chloride of mercury (1 to 1000), and dressed it with iodoform gauze and cotton. He says that there was a little dirt over the site of the wound when he first saw the patient, and that the bone did not protrude through the small opening, though he believed that the tear in the skin, which was perhaps a third of an inch long, was caused by the projection of the bone against the soft parts at the time of the injury.

When first seen by Dr. Roberts, on Friday, August 31, three days after the accident, the left hand was bluish black or slate color, and cold. A small wound of the skin existed on the palmar surface of the wrist over the lower part of the shaft of the ulna, perhaps one inch above the joint. It was a small puncture, and not gaping. The skin around this opening was blue and darker than the rest of the skin of the wrist or hand. The discoloration extended up nearly to the elbow, farther posteriorly than an-