world can better afford to lose a city or province than one of its great investigators, philosophers or teachers is well shown by Little, who quotes to this effect an editorial comment of the Boston Herald which questions as to whether the running over and killing in Paris of a simple unassuming, absent-minded man, named Curie, did not in its relation to the welfare of mankind constitute a calamity greater than the destruction of San Francisco by earthquake and fire.

TRANSACTIONS
OF THE
PHILADELPHIA ACADEMY OF SURGERY

STATED MEETING, HELD FEBRUARY 5, 1906.

The President, JOHN B. ROBERTS, M.D., in the Chair.

MODIFIED MÜLLER OPERATION FOR FLAT FOOT.

DR. H. AUGUSTUS WILSON presented a man upon whom he and Dr. R. V. Patterson had performed the combined operation of arthrodesis of the astragalo-scaphoid joint and transplantation of the tendon of the extensor proprius hallucis for the relief of flat foot, a modification of the operation originally described by Dr. Ernest Müller.[1]

Müller's operation consisted in using the tendon of the anterior tibial muscle, which he detaches from its insertion and passes through a hole drilled vertically through the scaphoid and attaches the tendon to the inferior-internal surface of the scaphoid, and divides the tendo achillis.

The operation as performed upon the patient shown was done in November, 1904, at the Philadelphia Hospital. The technique has been fully described.[2] Instead of using the anterior tibial tendon as Müller did, the tendon of the extensor proprius hallucis was taken. The hole through the scaphoid was made as by Müller. In addition to the tendon transplantation an arthrodesis was performed on the astragalo-scaphoid articulation.

Plaster-of-Paris fixation in the extreme over corrected position was maintained for four weeks. Carefully applied physical culture soon brought the muscles into function in their new relations, and enabled the patient to control the action of his feet

[1] Centralblatt f. Chirurgie, Jan. 10, 1903, p. 40.
[2] American Medicine, May 6, 1905, p. 725.

involuntarily. The loss of the extensor proprius hallucis in its former and normal position was very apparent at first, as the patient had toe drop. This was gradually overcome as the extensor brevis digitorum became developed in the assumption of its newly-acquired function.

The best evidence of the full success of the operation on the patient is the fact that during the year since the operation he has been engaged in hard work without inconvenience. He had been enabled to work full time without pain, which was impossible before the operation was done. As a preliminary to operative correction it is essential that the feet should be freed from all restraint of full free motion, as it is apparent that the presence of any restraint will interfere with muscular development. The necessary amount of free motion can be secured by the employment of the mechanical arch-producer devised by Dr. Wilson.

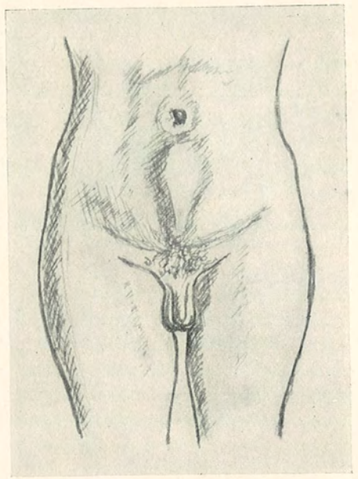
Dr. James K. Young said he had for several years employed in the treatment of flat foot the mechanical arch-producer devised by Dr. Wilson and found that it gave very good results. He generally applies the instrument after baking the foot for some time. This makes the parts more pliable and a greater degree of correction may be obtained at each sitting.

ABSCESS OF THE ABDOMINAL WALL COMMUNICATING WITH THE BLADDER WHICH CONTAINED A CALCULUS.

Dr. Joseph M. Spellissy related the history of a boy, eighteen years of age, who was admitted to the Methodist Episcopal Hospital on February 12, 1901. He had enjoyed perfect health till his sixteenth year. He then began to suffer with pain during urination and also and more particularly at the end of the act, when he passed pus. Occasional distress from retention of urine was relieved by catheterization. His condition sometimes kept him in bed and once he suffered for a week with œdema of the foot. During the three months prior to admission his abdomen had become swollen in the median line and he passed a small urinary calculus per meatum.

On admission, a reddened, elevated, tense inflammatory mass, shaped like an enlarged uterus, occupied the middle of the abdominal wall from just below the umbilicus to just above the pubes, and seemed on the point of rupture. (Fig. 1.)

Fig. 1.



Abscess of the abdominal wall communicating with the bladder containing a calculus.

Fig. 2.

The calculus of Case I, actual size.

FIG. 3.

Actual size of enterolith encrusted upon a pin; when first removed the enterolith completely enveloped the pin.

FIG. 4.

Inguinal abscess simulating hernia.

Under ether anæsthesia, the passage of a sound confirmed the suspicion of the presence of a vesical calculus; two incisions, one in the lower and one in the upper part of the abdominal mass, liberated a free amount of pus from apparently independent cavities in the abdominal wall. But a third incision, joining the other two, not only discovered a sinus uniting them but also a fistulous passage communicating with an indurated, thickened, suppurating bladder contracted on a roughened calculus (Fig. 2), measuring 2¼x¾ inches. The spontaneous effort of this calculus to deliver itself through a suprapubic abscess of the abdominal wall was assisted by incision, through which the calculus was removed. A catheter was inserted into the bladder per urethram, and both bladder and abscess walls were scrubbed with gauze and irrigated. Convalescence with suprapubic and urethral drainage terminated in an uneventful recovery with all sinuses closed in three months.

INFLAMMATORY MASS IN THE RIGHT ILIAC FOSSA CONTAINING AN ENTEROLITH THE NUCLEUS OF WHICH WAS A PIN, AND LATER DISCOVERED TO COMMUNICATE WITH THE APPENDIX.

DR. SPELLISSY also related the history of a man forty years of age who was admitted to St. Joseph's Hospital, complaining of a dense mass immediately internal to and apparently continuous with the anterior border of the right iliac bone, and extending from its anterior superior spine down to its junction with the pubis. He associated the origin and duration of this mass with an irreducible inguinal hernia existent for fifteen years.

Under ether anæsthesia, with the assistance of Dr. G. G. Davis, on April 11, 1903, an incision close to the margin of the right iliac bone, close to and below its anterior superior spine, passed through a most dense, apparently fibrous mass about three-quarters of an inch thick. Through this capsule an extraperitoneal space below the ileopectineal line was reached by blunt dissection and a hard fusiform body found within it. On extraction the body proved to be an enterolith, which on incision was found to contain a pin as its nucleus. (Fig. 3.) Nothing else was found in the cavity, which seemed to be a blind pocket, but it diffused a fecal odor. It was, therefore, drained and but partially closed. Within a week after the incision, a fecal fistula developed in the wound and persisted till the patient, without

warning, disappeared from the hospital; and was still present when he was readmitted, five months later, during the service of Dr. G. G. Davis.

Operation under ether anæsthesia by Dr. G. G. Davis, on September 23, 1903, found the fistula to communicate with the appendix. Both fistulous tract and appendix were excised, and the patient was discharged cured three months later.

AN INGUINAL ABSCESS SIMULATING HERNIA.

Dr. Spellissy presented a man, twenty-three years of age, an inmate of the Pennsylvania Training School for Feeble-Minded Children of Elwyn, who began three years ago to have in the right groin a small walnut-sized reducible mass, supposed to be an inguinal hernia. The subsequent growth of this mass was concealed by the patient until it was brought to the attention of the resident physician on November 25, 1905, when the condition illustrated in Fig. 4 was discovered and operation for strangulated inguinal hernia requested.

Examination showed an irreducible, untympanitic, painless mass (Fig. 4), with inflammatory pointing at a nodular apex coincident with an abdominal mass in the right iliac fossa, and a practically normal degree of temperature and rate of pulse and respiration. The patient's spine was undeformed, painless, and flexible. Diagnosis of iliac abscess gravitating to the thigh was made and interference postponed to the following day, that a long director for a counter opening might be obtained.

Under ether anæsthesia the inguinal abscess was incised, curetted, and drained with an evacuation of three to four pints of pus. The crural canal, however, was found impassable and there was no communication with the abdomen; the abdominal mass persisted and pressure upon it elicited no change in its bulk and brought no new pus into the inguinal wound. Exploratory incision for the removal of this mass is reserved for another occasion, and the diagnosis is now revised to inguinal abscess coincident with an independent abdominal mass.

PERI-ŒSOPHAGEAL ABSCESS CONTAINING A SWALLOWED FOREIGN BODY.

Dr. Spellissy related the following case: A freight conductor aged forty-four years was admitted to St. Joseph's Hospital with a large mass occupying the left side and median line of the neck, the thyroid cartilage being pushed to the right side. The mass did not fluctuate, the tongue was furred, and the pharynx was inflamed but neither it or the larynx, according to the report of Dr. G. Marshall, exhibited any marked abnormality.

The patient attributed his condition to the forcible swallowing of a piece of bacon, caused by a violent jolt while breakfasting, seven days before, in the caboose of a freight train that had stopped so suddenly as to throw the patient forward three feet. Efforts by the finger to recover the bacon were unsuccessful. Faucial distress was immediate, and reached such a degree by afternoon, that the patient went home to bed and remained there until his admission to hospital. During the interval he was subject to chills, fever, occasional delirium, and the gradual growth of the mass. The presence of any abnormality of the neck prior to the accident was denied.

An exploratory incision of three inches along the anterior border of the sternocleidomastoid, under ether anæsthesia and with the patient in the Trendelenburg position, discovered a prominent thyroid. Hypodermic exploration of this gland being negative, its out border was freed, the gland retracted inward and the dissection carried down to the vertebræ beside the œsophagus. Escape of foul pus into the pharynx and the wound was coincident with the disappearance of the mass and the discovery in the abscess cavity of a piece of bone, first thought to be the patient's hyoid but later found to be removable, to be foreign, and to measure $1\frac{1}{3} \times \frac{1}{2} \times \frac{1}{16}$ inches. Partial closure of the wound with drainage was followed by recovery without a fistula in forty-six days. Return of the patient for œsophageal bougieing was advised.

Dr. John H. Gibson was reminded by Dr. Spellissy's third case of a patient seen at the dispensary of the Jefferson Hospital while he was chief of clinic. The man brought an indignant note from his physician who said he sent the patient to a truss-maker and the latter had returned him with the statement that he had no hernia. Examination showed an iliac abscess which had come down on the sheath of the iliac muscle beneath Poupart's ligament. The mass disappeared when the man lay down, there was impulse on coughing and hence the swelling showed some of the signs of a femoral hernia. It was external to the vessels, how-

ever, and easily shown to be an abscess. There was no rigidity of the spine, as the abscess was iliac instead of psoas in type. The man was operated on and made a good recovery.

VICIOUS CIRCLE AFTER GASTRO-ENTEROSTOMY.

DR. JOHN H. JOPSON reported the history of the following case: An adult woman had suffered for more than a year with symptoms of chronic gastric ulcer, including prolonged and obstinate vomiting, sometimes containing fresh, sometimes altered blood, without any excessive hemorrhages at any one time, and an inability to retain anything but liquid diet. In the feces the occult-blood test was positive. Then solid food was attempted. The disease had resisted prolonged and careful medical treatment including confinement to bed for about nine months out of twelve. At the time of operation she was a chronic invalid, rather neurasthenic, thin, and somewhat anæmic.

Operation, November 15, 1905, Dr. Willard assisting. The stomach was dilated and somewhat lower than normal. Rapid scrutiny showed no external evidence of ulcer or cicatrix. A posterior gastroenterostomy was performed by the aid of the Moynihan clamps. The opening in the bowel was made 4 or 5 inches below the duodeno-jejunal angle, and in the stomach at the most dependent point of the greater curvature. At its conclusion the edges of the opening in the transverse mesocolon were sutured to the jejunum beyond the anastomosis by three stitches, one median, and one to either side. After the left-hand stitch was placed it was casually noted that there was slight puckering of the bowel at this point. The operation was otherwise completed in the usual manner.

Following the operation the patient vomited occasionally for two days, after which nausea and vomiting became less frequent, and finally practically ceased. Six days after the operation (November 21) the vicious circle was rather suddenly established, and the patient began to bring up large quantities of dark green bilious material. The vomiting resisted all the usual treatment and persisted during the following day. On the 23d it became frequent, and the patient's general condition, heretofore good, at the end of the day became suddenly much worse. There was a rapid rise of pulse rate in a few hours from 100 to 140, and it was evident that unless prompt relief was afforded the

patient would succumb. She was re-operated at midnight, November 23. The abdomen was reopened through the primary incision, the abdominal cavity found clean, and sharp angulation of the gut at the site of the gastroenterostomy was found as the cause of the symptoms. There were slight fresh adhesions between the adjacent surfaces of the two limbs of the spur. There was firm union of the opening in the mesocolon to the bowel, the edges of the opening thickened and apparently contracting around it, causing acute and absolute obstruction of the flow from the proximal to the distal limb. The adhesions were separated, the bowel straightened itself out, and the proximal loop emptied itself.

There seemed to be an improvement in the general condition of the patient dating from this time, which permitted the operation, heretofore a hurried and anxious one, to be finished more deliberately. The choice of treatment lay between freeing the mesocolon from the bowel and re-suturing it to the posterior wall of the stomach, and an anastomosis between the two limbs of the potential spur. The latter method was decided upon, and a medium-sized Murphy button was introduced as far away from the anastomosis as the short proximal limb permitted. The button was reinforced anteriorly by a Cushing suture. After operation the improvement in the general condition was prompt and gratifying. Vomiting was not checked at once but was less in amount. Retching was for a time a frequent and distressing symptom. One week after the second operation she was retaining her nourishment fairly well, nourishment being still liquid, and only vomiting occasionally. Two weeks after operation vomiting had practically ceased. The button was passed on the nineteenth day. Since convalescence has been established she has gained rapidly in weight, is free from gastric symptoms, and enjoys a liberal diet.

Moynihan emphasizes as one of the eight important points in his method of gastroenterostomy the suturing of the transverse mesocolon to the jejunum. His remarkable record of successes and the freedom of his patients from regurgitant vomiting after operation would seem to be good proof that there is no flaw in his technique in this direction, and I can only attribute the result in this case to the fact that one or both of the lateral stitches were probably placed too far from the anastomosis. If this were the case then any separation of mesocolon from the thin wall of

stomach would tend to drag together the proximal and distal portions of the jejunum, as would also any contracture of the opening in the mesocolon. Moynihan says the stitches should be placed just outside the line of anastomosis. The accident which occurred in this case serves to emphasize the necessity of care in the least and most minute details; at the same time it may be questioned whether, theoretically, at least, the same contracture might not occur at a later period, no matter what precaution in this respect was observed and Moynihan refers to a case operated by Czerny and reported by Stendel in which obstruction of the efferent loop had been so caused. If as there seems to be in these cases, and as Deaver emphasizes there is a tendency for the opening in the mesocolon to contract and become tough and cicatricial, it may in time cause an obstruction to the intestinal flow at the anastomotic site. Deaver, in speaking of the measures necessary to prevent hernia of the gut through the mesocolon says: "To obviate the occurrence of this complication most surgeons have adopted the precaution of stitching the edges of the opening in the mesocolon to the stomach. Mr. Moynihan, on the contrary, advises stitching it to the jejunal loop below the anastomosis. I cannot approve of this modification of the usual technique. Mr. Moynihan does not give any reason for this preference, and to my mind no good reasons exist. By suturing the mesocolon edges to the stomach we in the first place close the opening into the lesser peritoneal cavity; this is the most important function of the procedure. But in addition to this we are sure the gastric opening being the lowest portion of the stomach, as the mesocolon draws the stomach down into a funnel-shaped depression, and we moreover avoid any possible constriction of either loop of the jejunum. That this last is an important feature of the operation, I think, cannot be denied. Probably every surgeon has seen cases where the opening in the transverse mesocolon, not having been sutured to the stomach, contracted, and, becoming quite tough and cicatricial, presented a very material obstruction to the emptying of the proximal loop of the jejunum into the distal loop. But, although I know this cannot be blamed for all cases of vicious circle, it is certainly my conviction that obstruction of the afferent loop is the most usual cause of pernicious vomiting." Deaver makes no criticism of the practice

of the Mayos of stitching the mesocolon to the site of the anastomosis itself.

This case also illustrates the well-recognized necessity of prompt operation in the more acute cases of vicious circle. The symptoms may be as acute as those due to the commoner obstructions of the bowel, which are so rapidly fatal unless promptly operated.

PERFORATED GASTRIC ULCER; SUTURE AND RECOVERY.

Dr. John H. Jopson related the history of a man, 50 years of age, who for five years had suffered from stomach trouble, his symptoms consisting of pain in the epigastrium, coming on after eating, and occasionally associated with vomiting. Vomiting had ceased after a few months, but pain had continued up to the present time, and for eight weeks before admission had been much more severe. He had vomited once, two weeks before admission. On September 9, the day before he entered the hospital, pain in the epigastrium grew rapidly worse and soon spread to the right iliac region. Twelve hours later it involved the entire abdomen, being most severe in the right iliac fossa.

He was admitted on the evening of September 10, 1905, suffering acutely and complaining of pain in the right iliac fossa. Temperature 100⅗°, pulse 120, respiration 28. The abdomen was slightly distended, and rigidity was generalized but most marked on the right side. Tenderness was extreme in the right iliac region, slight elsewhere. The expression was good. He was admitted for operation with a diagnosis of appendicitis, and the history of long-standing gastric trouble was not elicited before operation. The duration of the acute symptoms and the physical examination indicated a spreading peritoneal inflammation, apparently originating, still more pronounced, in the appendicial region, and it was with this diagnosis that he was transferred to the operating-room one hour after admission.

An incision at the outer border of the right rectus muscle disclosed free turbid fluid in the abdomen and pelvis. The cæcum and appendix were congested, the base of the appendix surrounded by a curtain of peritoneum, as though it had found lodgment in one of the recto-cæcal pouches and later herniated through its wall. The appendix was liberated, and removed. It partook of the diffused peritoneal inflammation but was not

the cause of it. The ileum was examined and found to exhibit signs of beginning general peritoneal inflammation only. Fresh adhesions were discovered above the wound in the direction of the gall-bladder and pylorus. The wound was enlarged upward, almost to the costal margin, and a perforation, one-eighth of an inch in diameter, was found on the upper border of the pylorus, actively leaking, and was turned in by a layer of interrupted and one of continuous Lembert sutures. The infection had travelled downward to the pelvis along the right side of the abdomen, as indicated by numerous fresh adhesions and lymph-patches in this region. After free flushing with saline solution, the abdomen was drained from diaphragm to pelvis by iodoform and plain packing above and to the inner side, holding back the small intestines, a strip into the kidney pouch, and tubular and gauze drainage in the pelvis. A few silkworm-gut sutures were placed over the packing to hold it in place, but the wound was not closed. The patient stood the operation remarkably well and suffered but little shock at any stage, in spite of free manipulation of the abdominal contents and widespread infection.

After operation he was placed in the Fowler position and given frequent saline enemata, and convalescence was uneventful except for some vomiting on the second day after operation. The bowels were moved spontaneously on the third day and he was fed by the rectum for five days. The large wound healed slowly and he was in bed for nearly two months, and in the hospital for three.

The patient was brought in as a case of appendicitis; the gravity of his condition was recognized by the resident physician, and preparations for operation were begun at once.

Had a more complete history been elicited before operation a diagnosis of ruptured gastric ulcer should have been arrived at. As it was, the physical signs pointed strongly to an infection, reaching its greatest intensity in the appendicial region, symptoms which accorded well with the history of an illness dating back only a day or two, which the patient gave when first seen. There were no disadvantages attending the primary low incision; indeed it was proved to be advantageous, as when extended it gave the best possible drainage along the entire route from pylorus to pelvis, which the infection had already travelled, and the drainage was much more effective than could have been obtained by

primary incision in the epigastrium and secondary suprapubic drainage, as is usually advised. The freedom from shock during and after operation was very striking in a case with such an extensive peritoneal involvement.

GASTROPTOSIS AND DILATATION.

Dr. Edward B. Hodge reported the case of a woman 33 years of age who was admitted to the Presbyterian Hospital, July 31, 1905. For the preceding three months she had been under treatment in the dispensary of the hospital, but without benefit.

Since the birth of a child, in 1892, she had suffered from sour eructations, vomiting, burning pain in stomach, flatulence, marked constipation, with headache and extreme nervousness. From her usual weight of 140 pounds she had fallen to 114 pounds.

On inflation of the stomach, its lower border was found to be two and one-half inches below the umbilicus.

After some weeks' observation in the hospital, during which her weight had fallen still further, to 95 pounds, and she had become anxious for some operation for her relief, it was decided to elevate the stomach by shortening the gastrohepatic ligament.

On October 13, with Dr. Willard's assistance, Dr. Hodge opened the abdomen in the middle line below the ensiform. The lesser curvature was about half way to the umbilicus, and the greater curvature ¾ inch below the umbilicus. There was no evidence of ulcer, recent or old; the pylorus was opened and the gall-bladder found to be normal. Three transverse rows of interrupted silk-sutures were put in the gastrohepatic ligament, bringing the stomach well up under the liver. As the stomach was dilated, at Dr. Willard's suggestion, about 2 inches of the anterior gastric surface was folded in with a continuous transverse silk suture, midway between the curvatures. The abdomen was closed in layers. Convalescence was easy, and before patient left the hospital, on November 28, she was eating a generous mixed diet. She is now perfectly comfortable, does all her housework except washing, and weighs 125 lbs., a gain of 30 lbs. The bowels move daily without a laxative. Stomach tympany extends from just below the ensiform to ½ inch above the umbilicus.

Dr. H. D. Beyea said he had performed this operation upon

eight patients. All except one improved very remarkably. The exception was an extremely neurasthenic girl, who improved during a period of six months and then was obliged to nurse two sisters during attacks of typhoid fever; she is now no better than she was at first. All the other patients gained weight and all were relieved of the gastric symptoms.

URETERAL CALCULUS.

WITH A REPORT OF FIVE CASES.

BY JOHN B. DEAVER, M.D.,
OF PHILADELPHIA,
Surgeon-in-Chief to the German Hospital.

A SURGEON who is called to operate upon five patients suffering from ureteral calculus within as many months, has his attention somewhat forcibly drawn to the importance of diagnosis, and to the difficulties of treatment of this class of cases. In former years calculi arrested in the ureter were considered rare, but since more accurate methods of making a diagnosis in urinary surgery have been available, the frequency with which this condition is present has become more widely appreciated. According to Dr. C. L. Leonard [1] the use of the Röntgen rays has proved the ratio of ureteral to renal calculi to be as 66 is to 33 in cases where the diagnosis has not been confirmed by operation or recovery of the stone and as 44 is to 29 in cases where the X-ray diagnosis has been thus confirmed.

Renal calculi in their descent to the bladder are prone to be arrested at three points in their course: (1) Two inches from the pelvis of the kidney, as the ureter bends forward over the psoas muscle; (2) at the brim of the pelvis, where it dips down across the bifurcation of the common iliac artery; and (3) close to the vesical orifice of the ureter. The normal ureter is said to be one-seventh of an inch in diameter at the upper, one-fourth of an inch at the middle, and only one-tenth of an inch in diameter at the lower constriction. In the 44 cases of ureteral calculus referred to by Morris [2] the stone was arrested at the upper constriction in 19 instances, at the pelvic brim in ten and at the vesical extremity of the ureter in 15. These figures correspond very closely to those given by Bovee,[3] who collected 64 operations in which an impacted

calculus was removed from the ureter by the extraperitoneal route. Among these, 22 were found near the upper constriction, 17 at the pelvic brim, and 18 close to the bladder; while the remaining stones were found at other portions of the ureter.

The symptoms produced by the passage of a renal calculus are sufficiently familiar, and it only remains, after such symptoms have arisen and have subsided, to determine whether the stone has been forced back into the pelvis of the kidney, has been discharged into the bladder, or whether it has been arrested at some point in its journey. If it escapes into the bladder, symptoms of vesical calculus arise; and if the stone remains in the kidney those of renal calculus continue. The point that chiefly concerns us is to determine at what point of the ureter the stone has lodged. This is not always possible from the symptoms alone. Indeed Mr. Freyer[4] asserts that the symptoms produced by ureteral calculus are precisely those of renal calculus, except when the stone is lodged in the lower end of the ureter, within an inch or so of the bladder. He admits indeed that tenderness at the seat of impaction may be a guide, but claims that the Röntgen rays are even less satisfactory than in cases of renal calculus. Although I cannot entirely agree with his premises, I heartily endorse his conclusion, which is that the rule of surgery in doubtful cases is to first explore the kidney through the loin, and to pass a sound down the ureter before concluding the operation. If a stone is found in the ureter the wound should be enlarged, and the calculus extracted by appropriate means.

It appears to me, that tenderness at the seat of impaction and the information gained by a technically perfect skiagram, are two very valuable aids to diagnosis. From the symptoms alone it may be possible to determine that renal calculus has existed, and that a calculus is still present, either in the kidney or in the ureter, or in both. It is because we cannot be certain that not more than one calculus is present, that it becomes necessary to make sure that none is overlooked in the kidney even after the stone found in the ureter has been extracted.

A skiagram to be of value in these cases must throw a shadow of structures less dense than the least dense calculus; and as phosphatic and uric acid stones are by no means dense, it is necessary to see the shadows of the psoas muscle, to make sure that no calculus is present.

If after an attack of renal colic symptoms of renal calculus persist, we may be certain that the stone has at any rate not travelled as far as the lower ureter. In the latter case the symptoms of vesical calculus arise, and though no calculus can be found in the bladder, its location may usually be detected by rectal palpation or by cystoscopic examination.

Although a calculus may remain lodged in the ureter indefinitely without producing serious symptoms, yet such cases are exceptional and were such a calculus to be discovered by chance, it is questionable whether it would not be the surgeon's duty to remove it as a prophylactic measure. Leonard[5] refers to 26 calculi, found as it were by accident, impacted in the ureter, all of which were safely passed into the bladder while the patients remained under medical care. Cabot[6] thinks highly of massage in such cases as an aid to the descent of the stone. But it seems to me that the dangers which may ensue from neglect of ureteral calculus are greater than those which attend its removal by operation. Among 21 operations mentioned by Fowler[7] there were only three deaths; and in reviewing the literature of the last couple of years while preparing this paper, records of 25 operations for ureteral calculus have been found, many of them not in Fowler's list, with only 2 deaths—one in a patient with recurrent carcinoma of the ureter, and the other in my own patient, to be presently mentioned.

If the stone is rough and mammillated it is more apt to excite ulceration and inflammation, although less apt to absolutely occlude the ureter than a smooth stone. On the other hand, while a small stone may be more easily passed by ureteral peristalsis and by the *vis a tergo* of the kidney's excretion, yet if it does become arrested it is almost certain to cause hydronephrosis, and give rise to serious symptoms in a short

time. When such cases are seen before marked infection is present, the mortality from the operation is slight, as the kidney does not then require removal. The condition of the kidney is really, I think, the main point upon which the success of treatment must depend. In the only one of my cases which terminated fatally, there were calculi impacted in both ureters and the operation which removed the stone from the left ureter was unsuccessful because of the diseased condition of the right, which was not known until the post-mortem examination.

The route to be chosen for the removal of the stone is a matter of much importance. If the stone is known to be near the bladder, it is usually most successfully removed intravesically. In the female the vaginal route has been employed, and the ureter exposed within the layers of the broad ligament. This appears to be less satisfactory a method than the intravesical, and the same may be said of the perineal route in the male. In the female the urethra can be dilated sufficiently to admit suitable forceps, or even the finger, and, after slightly incising the vesical orifice of the ureter, the calculus can usually be extracted without much difficulty. This plan obviates the possibility of a vesico-vaginal or uretero-vaginal fistula, which is not very remote when the vaginal route is chosen. In one of Freyer's patients the ureter was exposed by incising the vagina, but the stone slipped further up the ureter and could not be extracted. It was, however, found in the dressings on the following day; but the patient developed pelvic cellulitis, had a very slow convalescence, and when last seen still suffered from kidney symptoms. In the case of a patient where intravesical manipulations had failed to dislodge the stone, Millet [8] succeeded in evaginating the obstructed ureteral outlet through the dilated urethra, by means of one finger within the bladder and another in the vagina. With the parts thus under full control he was able to remove the calculus with success. Crawford [9] successfully removed from a male patient a calculus measuring one and three-eighths inches in diameter by intravesical dilatation of the ureter. In the

third case recorded to-night I found it impossible to extract the stone extraperitoneally, and accordingly opened the bladder above the pubes, and by slightly incising the ureter was enabled to deliver the stone into the bladder and successfully remove it.

But this means will not suffice unless the calculus is lodged very close to the vesical orifice of the ureter; and for those stones impacted more than an inch away from the bladder wall, I would strongly recommend the extraperitoneal operation. This is of course the route selected in cases where the location of the calculus is doubtful, since it affords access to practically the entire length of the urinary tract. In enlarging the lumbar incision downwards care should be taken not to injure the spermatic cord, and at the conclusion of the operation the anterior abdominal wall should be repaired as after an operation for ventral hernia. Even in a child of 3 years Betham Robinson [10] exposed, extraperitoneally, the ureter close to the bladder wall and successfully removed the impacted calculus.

As the peritoneum is stripped back from the iliac fossa, it carries the ureter along with it, and this stricture is therefore to be sought on the vesical side of the wound. Proper knowledge of pelvic anatomy is essential to the operation. When a stone is exposed in the ureter, it is proper to try to dislodge it, and to push it either upward into the pelvis of the kidney, or down into the bladder. In doubtful cases, where the kidney alone is first exposed, it may be possible to push the calculus on into the bladder by a bougie, or even to extract it through the kidney by means of the urethral forceps. If it can be pushed on into the bladder it can be satisfactorily removed by the evacuator.

An incision into the ureter itself is usually to be avoided, although in my own opinion the probability of a permanent urinary fistula remaining is exaggerated. But an incision through the renal cortex, or one directly into the pelvis of the kidney, is to be preferred, since the tract required for drainage is shorter, and the wound may be more closely sutured. But if the calculus cannot be dislodged, it is safer to incise the ureter than to attempt to crush the stone *in situ*. If the cal-

culus is oxalate of lime it may be impossible to crush it, without so injuring the ureter as to cause sloughing; and even if it could be successfully crushed, the detritus would be very likely to give rise to very serious trouble before being completely evacuated. The plan adopted by Mitchell [11] and by Corson [12] of placing sutures before extracting the stone, thus using the calculus as a bobbin, may prove advantageous when the wound is deep. It has been my practice to employ when possible two rows of sutures, the first, of catgut, for the submucous tissues, and another of silk, and of the Lembert type, for the muscular walls of the ureter. This plan I am convinced decreases the probability of a urinary fistula persisting. Fiori [13] has recently recorded a remarkable operation in which he exposed the ureter extraperitoneally, split it for a distance of sixteen centimetres (12 centimetres in its abdominal and 4 centimetres in its pelvic portion) and thus succeeded in extracting 11 or 12 small calculi, the largest weighing 5 grammes, being impacted close to the bladder. He then reconstructed the ureter by sutures using a sound as a guide; and had the satisfaction to have the urinary fistula which resulted close a few days after the operation. Although, as he acknowledges, it was a difficult and somewhat hazardous operation, yet the event justifies his course of action in preferring ureterolithotomy to nephrectomy, which would have been the only alternative.

Finally, a word may be said about the occurrence of carcinoma in the ureter, as the result of calculus disease. One of the patients I operated on showed the presence of carcinoma in the ureter immediately above the site of impaction, but this would probably have escaped detection if the kidney had not been so diseased as to require removal, and hence to allow a microscopical study to be made of the entire specimen.

Primary cancer of the ureter is admittedly rare. Metcalf and Safford [14] only one year ago were unable to find more than 7 authentic cases on record, including one of their own; and in a majority of these cases no calculus was present. It is probable that most cases of cancer of the ureter have escaped

detection, and that as operations on the ureter are more frequently performed, such changes will be more often found. The mere possibility of malignant changes occurring, however, only serves to emphasize the need of prompt removal of the calculus.

The following cases of ureteral calculus are reported with the hope of exciting discussion among the fellows; and among some of the unsettled points on which I am anxious to learn their views, I would particularly mention the following:

The value of the X-ray and the cystoscope with bougieing of the ureter in diagnosis; the significance of localized tenderness. The propriety of exploring the ureter intraperitoneally to locate the suspected stone.

The question of removal of quiescent or latent stones.

The best route for the removal of juxta-vesical stones: whether perineal, vaginal, intravesical, suprapubic, or extraperitoneal.

The proper treatment of the stone when found: whether it should be pushed on into the bladder, should be crushed, or whether the ureter should be incised.

The best method of suturing the ureter.

Whether nephrectomy is to be countenanced, except for incurable disease.

All of the following cases were operated upon in the German Hospital:

Case I.—*Ureteral Calculi (Impacted) Removal.*—Miss ——, white, aged 22. Admitted July 24, 1905. For past two years has complained of pain in right kidney region, referred downward into inguinal region; pain almost constant, but has had three attacks of severe pain at intervals of six months; duration seven to fourteen days, always accompanied by nausea, vomiting and dizziness.

Abdominal examination. Right kidney movable, not enlarged, no distention or rigidity, no tenderness over abdomen. No X-ray taken.

Operation; July 25, 1905. Vertical incision right ileocostal space; pelvis of the kidney found to be the seat of small hydrone-

phrosis, about the size of a lemon; ureter found dilated to the size of the little finger. The ureter was incised and the fluid allowed to escape, a probe was introduced and a stone palpated; after much effort the stone was brought upwards and delivered through the opening in the ureter at the pelvis of the kidney. Discharged, cured, August 21, 1905.

Case II.—*Nephrolithiasis Double. Impacted calculi both Ureters.* Mr. ——, white, aged 33. Admitted September 7, 1905. On day of admission was seized with sudden acute pain in left lumbar region radiating from near crest of the ileum to the left testicle, testicle retracted. The patient was nauseated, suffered from frequent urination, passing large quantities. Abdomen soft, no rigidity, no pain on pressure over left kidney or course of ureter. No palpable mass. X-ray; dense shadow in region of right kidney.

Operation, Sept. 9, 1905. Oblique incision left flank.

Calculus found impacted in ureter 3 cm. below the pelvis of the left kidney. An effort was made to work the stone up into the pelvis, but failed; the kidney was delivered and an incision made horizontally to the poles into the pelvis and scoop and forceps used to deliver the stone, but failed. On palpation the stone was felt in previous location; an incision was made in the long axis of the ureter over the calculus and the same delivered. The stone was the size of a small pea, irregular and very hard. Before suturing the ureter a probe was passed into the bladder. This patient did well for three weeks, when he was seized with severe pain in the right loin and in a very short time became anuric and died October 10, 1905. Autopsy showed an impacted stone in the right ureter.

Case III.—*Urethral Calculus. Suprapubic Urethrolithotomy and Lumbar Incision.*—Mr.——, white, aged 49. Admitted October 16, 1905. In 1896 was operated for acute appendicitis. In January, 1905, was seized with severe pain in right side referred downward to the right groin. Was operated for abdominal adhesions in June, 1905, but not relieved.

Present illness: Pain in paroxysmal, coming on suddenly at any time, beginning apparently in the right inguinal canal and referred to the right kidney. These attacks are followed almost immediately by vomiting, requiring morphine for relief, but are not followed by irritability of the bladder.

Abdominal examination: Tenderness on pressure at a point on the semilunar line opposite the anterior superior spine. X-ray showed large dense shadow in region of the kidney, and small one near bladder.

Operation October 30, 1905. Curved oblique incision right lumbar region to the anterior spine of the ilium. A stone was located in the ureter in the wall of the bladder. After many attempts to dislodge the stone either into the bladder or by drawing it up into the ureter, all of which were unsuccessful, the wound was covered and the patient placed in the dorsal position and the bladder opened suprapubically; the vesical orifice of the ureter was incised slightly and by pressure from behind the stone was finally brought into view and delivered. The stone was the size of a split pea and very hard. The suprapubic fistula closed on the eighteenth day. Patient was discharged cured Nov. 25.

Case IV.—*Ureteral Calculus.*—Mrs. ——, white, aged 32. Admitted November 21, 1905. Patient states that at the age of 21 she had an acute attack of epigastric pain, with vomiting; this attack lasted for one or two days and was associated with severe headache. Had a similar attack six years ago, lasting three days. Patient never vomited blood, always biliary material.

Present history dates back five years, when patient began to suffer with acute pain in the left iliac region radiating to the right loin and back; pain was so acute that anodyne was used for its relief. These attacks occurred at intervals from one to two attacks each month. For one year the patient was free from these attacks.

Six weeks before admission to the hospital attacks of very acute pain, beginning in the right iliac region, radiating to the right lumbar region, occurred every day or night. Large doses of morphine were used for these attacks. Patient was never jaundiced, never noticed blood in the urine.

Upon examination, the right kidney was palpable and movable; left kidney not palpable; no tenderness elicited over either right or left iliac region.

X-ray; dense shadow in region of right kidney, formed body.

Operation, November 25, 1905. Incision right flank, kidney exposed. A stone was found in the ureter. Stone was removed and the kidney, being diseased beyond operative repair, was also removed. Patient was discharged cured December 14, 1905.

CASE V.—*Calculus in Right Ureter.*—Miss ——, white. History of right renal colic for five years. Nothing of note in family or personal history other than attacks above referred to. Point of tenderness a little above the line of the right anterior superior spine of the ilium very decided; upon one occasion this tenderness suggested to the mind of the medical attendant the probability of inflammation of the appendix; this was ruled out, however. X-ray, negative.

Operation revealed a stone in the right ureter three inches below the pelvis of the ureter, with stricture of the ureter to the extent of one inch, through which it was difficult to pass the smallest probe. After incising the ureter above the stricture the stone was removed. The ureter between the stricture and the kidney was dilated to the size of the little finger. The kidney was so diseased that it was removed. The patient made an uneventful recovery. Microscopical examination of the ureter showed clearly carcinomatous change.

REFERENCES.

[1] Leonard, C. L. Lancet, 1905, i, 1632.
[2] Morris. Quoted by Thorndike: Boston Med. and Surg. Jour., 1905, i, 659.
[3] Bovee. Washington Med. Annals, 1905, iv, 233.
[4] Freyer. Lancet, 1903, ii, 583.
[5] Leonard. *Loc. cit.*
[6] Cabot. Boston Med. and Surg. Journ., 1905, i, 653.
[7] Fowler. ANNALS OF SURGERY, 1904, ii, 943.
[8] Millet. Northwestern Lancet, Minneapolis, 1905, xxv, 93.
[9] Crawford. Amer. Med., 1904, ii, 971.
[10] Betham Robinson. Brit. Med. Journ., 1905, i, 357.
[11] Mitchell. Fowler, ANNALS OF SURGERY, 1904, ii, 943.
[12] Corson. Georgia Practitioner, 1905, i, 109.
[13] Fiori. Policlinico, Roma, 1905, xii, Sez. Chir., 49.
[14] Metcalf and Safford. Amer. Journ. Med. Sc., 1905, i, 50.

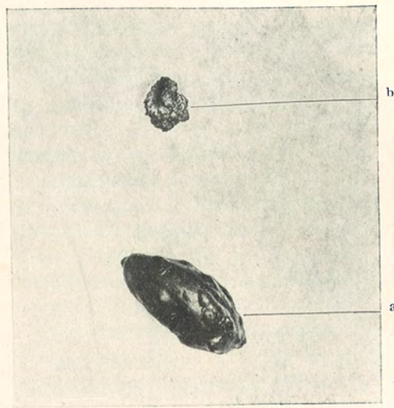
THE TRANSPERITONEAL EXAMINATION OF THE URETER IN CASES OF SUSPECTED URETERAL CALCULUS, AND THE COMBINED INTRA- AND EXTRA-PERITONEAL URETERO-LITHOTOMY.

BY JOHN H. GIBBON, M.D.,
OF PHILADELPHIA,
Associate Professor of Surgery in the Jefferson Medical College; Surgeon to the Pennsylvania Hospital.

DURING my recent service at the Pennsylvania Hospital I had three cases which illustrate well certain advantages to be derived from the transperitoneal examination of the ureter and the necessity for a thorough palpation of the ureter when the abdomen is opened for lesions of other organs, and especially for the less acute varieties of appendicitis. Before enumerating these advantages a brief report will be made of two cases of ureteral calculus in which the stone was located by transperitoneal palpation and removed by combined intra- and extra-peritoneal uretero-lithotomy and of a third case in which ureteral calculus was suspected but not found and yet in which the real lesion, a cystic kidney, was detected.

CASE I.—An Italian, 39 years of age, male, admitted to the Pennsylvania Hospital on August 3, 1905. The patient spoke English very badly but was sent in by his physician as a case of subsiding appendicitis. He gave a history of repeated attacks of pain in the abdomen, accompanied by vomiting and diarrhœa. The attacks lasted for three or four days, when he was able to get up and go about. Until the present attack he had been well for a year. The present attack had lasted for three or four days and was accompanied by vomiting. Excepting for some slight tenderness in the right iliac fossa the patient at the time of his admission was free of symptoms. There was no tenderness over the kidney and he complained of no urinary symptoms; there continued a persistent tenderness on deep pressure in the right iliac fossa. He improved so much in a few days and the tenderness was so slight that my first inclination was to allow him to go out and return later if he had another attack. In other words, I was

not prepared to accept the diagnosis of appendicitis. In view of the history, however, I concluded to operate. The patient's urine showed a number of red-blood corpuscles. Under chloride of ethyl-ether narcosis I operated on the 8th of August. The abdomen was opened through the right rectus and when searching for the appendix my finger came in contact with a hard mass just below the iliac vessels in the true pelvis. It seemed about the size of a hazelnut, was very hard, and at first immovable. Although shaped like a gland it was hard and there were no other glands enlarged. As it was in the line of the ureter I concluded it was probably a ureteral stone. I left it for further investigation and proceeded to examine the appendix. This organ showed evidences of an old inflammation, the vessels over it being very tortuous and there being numerous adhesions all about it excepting at the extremity. These adhesions bled quite freely when divided. The appendix stump was crushed with forceps and inverted by a purse-string suture of gut. In order to make a more thorough examination of the small mass in the pelvis I enlarged my incision downwards through the rectus. I was then able to determine that the mass was a stone in the ureter and decided to remove it extraperitoneally without however making another incision through the abdominal wall. The original incision was further increased downwards and the peritoneum stripped from the abdominal and pelvic wall down to the ureter. With one finger in the pelvic cavity I was able to push the ureter and stone up into the extraperitoneal wound within easy reach, but not within sight. I then opened the ureter longitudinally and removed a long, black stone about the size of the end of the little finger and cucumber shaped. In order to remove the stone quite a large opening was made in the ureter. A gauze drain was then passed down to the opening in the ureter and the peritoneal cavity was tightly closed with a continuous gut suture. The upper portion of the wound in the rectus was closed with sutures through the fascia. The superficial tissues were closed excepting at the lower end of the wound, where the gauze drain made its exit. In spite of the flow of urine through the gauze, which was quite profuse for about two weeks, the abdominal wound healed without any infection. On the 2d of September very little urine was discharged from the sinus, and on the 6th of September the sinus was closed. It opened later, however, for a short time, but closed again.



Ureteral calculi, exact size; a, Case I; b, Case II.

Case II.—A domestic, aged 32, was admitted to the Pennsylvania Hospital, August 12, 1905. This patient was sent into the hospital at night as a case of appendicitis and was seen in my absence, by Dr. Francis T. Stewart. Dr. Stewart did not think the case one of appendicitis or one demanding immediate operation. I saw her the next day and could not make up my mind that there was any inflammation of the appendix. She gave a history of repeated attacks of pain in the right side of the abdomen in the appendiceal region, accompanied by vomiting. The pain was more or less fixed, there being no radiation to the back or to the bladder: there were no urinary symptoms. The examination of the urine, however, on the day after admission showed a few red-blood corpuscles and a trace of albumin. Repeated examinations of the urine continued to show red-blood corpuscles. Examination of the abdomen the day after admission showed considerable tenderness over the right kidney. This, however, disappeared and the only tenderness was in the iliac region. A few days later the patient passed both blood and mucus by the bowel and the cæcum and sigmoid were quite tender. These symptoms did not persist, as did the microscopic blood in the urine. A differential diagnosis between appendicitis, colitis, renal calculus and ureteral calculus had to be made. With the disappearance of the renal tenderness and of the blood and mucus in the bowel movements, and in view of the absence of the characteristic symptoms of appendicitis, I made a diagnosis of a probable ureteral calculus on August 30th, and advised operation. This diagnosis was based on the continued tenderness in the iliac region, the repeated attacks of pain accompanied by slight rise of temperature, and especially the microscopic blood in the urine. Urinary symptoms were absent in this case, as in the previous one; there was no frequency of micturition and no pain in the bladder. The right kidney was not movable. The menses had been irregular and painful. I determined to follow the same technique as in the previous case, especially as I was in some doubt regarding the diagnosis. Therefore, on the 31st of August under ethyl chloride-ether anæsthesia the abdomen was opened through the outer edge of the right rectus, low down, the appendix being readily found and removed as in the previous case; it was perfectly normal. The ureter, which was thickened, was easily felt crossing the iliac vessel. About one inch below the

vessels a hard, small, immovable mass was felt. The peritoneum was stripped away from the abdominal and pelvic walls after increasing the incision downwards. The ureter was exposed and brought plainly into view. Great assistance was also derived in this case from a finger within the pelvis pushing the ureter up into the extraperitoneal wound. The ureter was incised longitudinally and a small irregular stone, very rough and adherent to the ureteral mucous membrane, was removed. A gauze drain was inserted down to the ureteral wound, the peritoneal cavity was closed, and all but the lower portion of the wound in the abdominal wall. Although in this case a smaller incision in the ureter was required than in the previous one, there was a greater and more prolonged leakage of urine. The abdominal wound healed promptly excepting at the point of drainage, and the patient never had an abdominal symptom. On September 30th, one month after the operation, there was no flow of urine, there was, however, some discharge from the drainage tract which remained open for about two weeks. The patient was discharged on November 29th, the wound having remained closed for about a week.

CASE III.—A man, aged 22, admitted to the Pennsylvania Hospital, December 21, 1905. This patient had been in the hospital a number of times, once for typhoid fever, again in December, 1903, for an appendiceal abscess which was operated upon by Dr. Le Conte; in February, 1904, he was again admitted suffering from attacks of pain which seemed to indicate a renal calculus. At this time Dr. Harte explored the left kidney but found no stone. Upon his last admission the patient stated that since his last operation he had had attacks of pain coming on every few weeks. The character of the pain was much the same as in his previous attacks and was accompanied by nausea and vomiting and fever. At the time of his admission he was suffering considerable pain and had some temperature. This promptly subsided and he was quite comfortable the next day. When examined there was considerable tenderness in the left lower abdomen and the pain extended down to the bladder and into the left lumbar region. Later, the tenderness seemed more marked over the kidney and ureter. The tenderness over the kidney gradually disappeared but that in the left iliac region and in the course of the ureter remained. On admission there were a few red-

blood corpuscles in the urine, but these were not found at any of the subsequent examinations. As the kidney had been thoroughly explored only ten months before and as the tenderness persisted over the ureter, I determined to explore this organ. As there was nothing to indicate the exact situation of the supposed stone I determined to open the abdomen as in the previous cases and thoroughly palpate the entire urinary tract. On December 30th, under ethyl chloride-ether anæsthesia, I made an incision through the left semilunar line into the abdominal cavity. I had no difficulty in finding the ureter and tracing it from the bladder to the kidney. It was normal in size and there was no evidence of any stone. The right ureter also could be felt in its lower portion and there was nothing abnormal about it. I had previously examined the bladder for stone with a negative result. On palpating the kidney through the wound I discovered it to be enlarged and cystic. The patient was turned on his abdomen, the kidney exposed through a straight incision in the lumbar region, and removed. During the separation of the kidney from the peritoneum I kept one hand in the abdominal wound as a guide. This greatly facilitated the separation of the kidney, which was densely adherent at its lower pole to the colon and peritoneum. The abdominal wound was closed before the nephrectomy was completed. Several of the cysts were ruptured before the kidney was delivered but not before the abdominal wound was closed. The fluid in the kidney did not have an ammoniacal odor and was of a milky consistency. The whole kidney was a mass of large cysts. The pedicle was ligated *en masse* and the individual vessels tied with smaller gut. A small drain was inserted. The patient's convalescence was perfect excepting for a severe pneumonia which he developed promptly after the operation. It is interesting to note that this pneumonia occurred in the right lung. A few days after the operation he was passing as much as sixty-five ounces of urine. There was no doubt from the examination of the kidney and from the character of its contents that the right kidney was secreting all the urine passed at the time the operation was done.

Palpation of the ureter through an abdominal wound is nothing new. I have for some time made it a routine procedure in all cases where the abdomen is opened for other con-

ditions and where these conditions do not seem to be sufficient to account for all the symptoms, and I am especially careful to do this in all interval operations for appendicitis. Although never generally advocated, the immediate removal of a stone detected by palpation through the abdomen has been practiced, yet, so far as I can learn, the removal has been done through the peritoneum or through one of the various extraperitoneal incisions, such as the lumbar, iliac, inguinal, sacral, vaginal or rectal. I believe then that the practice in the two cases reported by me of the removal of the stone extraperitoneally but through the same incision in the abdominal wall, and while the abdominal wound remained open, has not before been employed. Most authorities recommend the closure of the peritoneal cavity and the making of another incision for the extraperitoneal exposure and removal of the stone. In the two cases just described there was no doubt of the great advantages to be derived from having a finger in the peritoneal cavity and on the stone during the exposure of the ureter in the extraperitoneal portion of the wound. An objection to this method which naturally presents itself is the danger of infection of the peritoneum, but in neither of my cases did this occur and if the operator hesitates to open the ureter while the peritoneal wound is still open he can easily close the latter after the thorough exposure of the ureter; he will then have had all the advantage of the finger in the abdomen during the exposure of the ureter and the location of the stone. With a certain amount of care, however, I know that infection of the peritoneal cavity can be avoided, and moreover that the exposure of the ureter and extraction of the stone are easier and accompanied by less injury of the ureter itself when the operator has the assistance of a finger in the pelvis pushing the stone and ureter up into the extraperitoneal wound.

Another advantage to be derived from the manipulation both within and outside the peritoneum is the fact that in this way the ureteral stone can be more easily forced into the bladder if this is thought possible or back into the dilated ureter where an incision is apt to close earlier and better than

at the site where the stone has been arrested. Case III illustrates the advantage of intraperitoneal examination of the ureter, even when no stone is present. It enabled me in this case to detect a cystic kidney on the left side which I would not have been able to diagnose by palpation until it had reached much greater size. In a certain number of cases of stone in the lower portion of the ureter it is difficult to determine in which ureter the stone is. In such cases localization through an abdominal incision is strongly recommended.

From the limited experience gained by these two cases I am not prepared to advise the removal of every ureteral stone by the combined intra- and extraperitoneal method, but in all doubtful cases and in all cases where a stone is found in a ureter when the abdomen has been opened for some other condition I do advocate its immediate removal either through a separate incision or after the manner just described. To remove these stones through the peritoneum is seldom justifiable, as the risks of a peritonitis are too great.

In neither of the above cases was the ureter sutured. I felt that the wound would close after simple drainage just as the common duct closes after the removal of a stone. In any future cases, however, I think I shall close the incision in the ureter and introduce a drain down to the sutures. Henry Morris states in this connection that suture of the ureter is of doubtful utility when it is much damaged and that it may be harmful.

I would urge the careful palpation of the ureter in all cases where the abdomen is opened for chronic or subacute inflammation of the appendix or uterine appendages. And also that where nephrotomy is done for stone, whether a stone is found or not, a thorough examination of the ureter, by means of a ureteral probe, should be made. One of the great objections to the use of the ureteral probe through the bladder is the difficulty of catheterizing the ureters in the male, and the further difficulty of differentiating a stone from some other form of obstruction, such as a kink or stricture. The presence

of microscopic blood in urine, especially after an attack of pain, is of great diagnostic value.

Dr. William L. Rodman, speaking to the questions propounded by Dr. Deaver, said that the Röntgen rays are not always satisfactory in the diagnosis of calculi in the kidney and ureter, many mistakes being made thereby. This is especially true when the supposed lesion is low down and well toward the median line of the pelvis. In this location little bodies described as centres of calcification in cartilages have by different observers been mistaken for calculi. With Dr. Pfahler the speaker had had at least three such cases. In the first case, a woman, the skiagram showed what seemed to be certainly two stones in the ureter low down near the bladder. His suspicions were aroused, the ureter was catheterized and the hard bodies felt and demonstrated to be disconnected with the ureter. Very recently a similar condition was shown by a skiagram in a young man without renal or vesical symptoms. It was plainly such a case as Bevan and others have demonstrated to be points of ossification or calcification of the ligaments. Bevan, of Chicago, has seen many such cases. As to opening the ureter by the transperitoneal or extraperitoneal route he believes there is no doubt of the almost unanimous opinion that the extraperitoneal is the safer. In fact, it may be said in view of all that has been learned upon the subject that the intra-abdominal method is at the present scarcely warranted. The operation can be done by this method but the surgeon who so does is courting disaster. In cases of encysted stone near the bladder the site can usually be reached through the bladder by means of a suprapubic cystotomy. He was interested in Dr. Gibbon's reported combining of extra- and intraperitoneal methods in removing a calculus. Dr. Gibbon is correct in saying there is danger of soiling the peritoneum; he would prefer the extraperitoneal route always, but when working in the abdomen as was Dr. Gibbon the method employed by him may very well be used.

Dr. George G. Ross spoke of a case of ureteral calculus in which operation was not performed. The patient had repeated attacks of renal colic and after each passed bloody urine. The X-ray showed a dense shadow near the neck of the bladder. The man was a travelling salesman and declined operation, taking

morphine to relieve the attacks. One morning he reported jubilantly that he would have no more attacks as the night before he had passed an enormous amount of urine during sleep and a day or two later the calculus was passed by the urethra. There evidently had been obstruction of the ureter and hydronephrosis, which was relieved by the passage of the stone.

Dr. John B. Roberts said that ten years ago he reported the transperitoneal removal of a ureteral calculus. He found no difficulty in keeping the peritoneum perfectly clean and both the ureteral and abdominal wounds healed by first intention.

Dr. Gibbon, in closing, corroborated Dr. Rodman's statement regarding transperitoneal operation upon the ureter; it is seldom justifiable. In the cases reported, however, the removal of the calculus was not transperitoneal, the ureteral operation itself being entirely outside of the peritoneum. Under such circumstances if the surgeon so desires he can close the peritoneum before taking the stone out of the ureter, but the manipulation made possible by the peritoneal opening enables one more easily to remove the calculus. Without such opening it is utterly impossible to get at the ureter throughout its entire length unless the kidney be delivered and access gained in that manner. In both the cases reported the microscopic findings of blood in the urine were of great diagnostic value. If a stone is found in the ureter when operating for appendicitis, it should be removed. In such an instance, as before stated, the surgeon can choose the route by which he will remove the calculus.

RENAL CALCULUS WITH MAGGOTS WITHIN THE STONE.

Dr. John H. Gibbon reported the case of an Italian laborer, 33 years of age, who was admitted to the Pennsylvania Hospital July 21, 1905, and transferred to the surgical wards on July 24. At this time he had all the symptoms of a pyonephrosis on the left side, although he was able to be up and about at times. There was a large quantity of pus in the urine and marked tenderness over the left kidney. Cystoscopic examination was unsatisfactory. He was operated upon and a large soft calculus was found to occupy nearly the whole pelvis of the kidney, which extended up in the calices and was removed in two portions. There was a large quantity of pus in the kidney which had a very foul odor, The wound was drained and partially closed. The stone was examined in the laboratory on the same day of its removal.

The larger portion measured 2x2½ cm. in diameter; the small portion measured 1x1½ cm. and the weight of both was 17.5 grams. Passing through the larger portion of the stone were a number of small smooth channels in which were found numbers of minute maggots. Dr. Gibbon saw the specimen the next day when the maggots were still quite active, crawling in and out of the channels in the stone. The maggots were so small that their nature was doubted for a while. A number of them with a portion of the stone was sent to Dr. Charles Wordell Stiles, of Washington, who reported that they were the maggots of the ordinary domestic fly. On the fourth day after the operation the dressings removed from the wound were kept over night wrapped in a sterile piece of gauze surrounded with wax paper, and on the following morning there were a large number of full-grown maggots present. In none of the subsequent dressings were maggots found. The patient made a good recovery from his operation, but as the sinus continued to discharge large quantities of pus, and as occasionally the drainage would be interfered with, Dr. Gibbon removed the kidney on November 25th. The patient made a satisfactory recovery from the second operation.

In questioning the patient it was learned that in Italy he had some years previous had inflammation of the bladder for which irrigation was done. The first symptoms of his present illness appeared a few months before his admission to the hospital and at this time he irrigated his own bladder. He says that he was always careful in performing this irrigation to have the catheter and solution clean, and he cannot recall ever having seen flies on the catheter. It is probably true, however, that this was the source of the infection.

HYDRONEPHROSIS; DISTENTION OF URINARY BLADDER.

Dr. Gibbon also reported *a case of cystic kidney with obliterate ureter associated with a fibroid uterus causing a chronic distention of the bladder with retention of urine.*

This patient was admitted to the Pennsylvania Hospital on November 17, 1905. She was 43 years of age, a widow, and had never had children. She came to the hospital because of a large tumor in the lower portion of the abdomen and marked vesical and rectal tenesmus, the latter symptoms being of but a few weeks' standing. Examination showed a tumor projecting above

the pubes which was quite hard and which on bimanual examination seemed to move with the uterus. Two distinct tumors could be felt in the uterus, one in the anterior portion just above the cervix which pressed upon the bladder, and the other could be felt through the rectum which was nearly occluded by it. A diagnosis of fibroid tumors of the uterus was made and a hysterectomy recommended. When the abdomen was opened it was discovered that the tumor felt above the pubes was a greatly distended bladder. One hour previous to the operation the patient had been catheterized and 26 oz. of urine withdrawn; on the table the catheter was again introduced and 20 oz. of urine withdrawn. The bladder did not contract when emptied but collapsed in thick folds, the wall appearing to be about ½ inch thick. The uterus contained a number of fibroids; one on the anterior surface low down pressed against the bladder in such a way as to produce obstruction just as an hypertrophied prostate does in a man. Examination of the ureters at their point of crossing over the iliac vessels showed no distention of either. An examination of the kidneys showed a normal right kidney but the left was an enormous cyst. A hysterectomy was done and then the left kidney was exposed through a lumbar incision. It was so large that it was impossible to remove it without emptying it, and even after the escape of a large quantity of grayish, odorless fluid the delivery of the kidney was difficult. In ligating the pedicle the ureter could not be made out. This kidney was subsequently examined in the laboratory and no ureter could be found. The kidney substance had been so completely destroyed that none could be found microscopically. The kidney measured 25 cm. in length by 15 cm. in width, and the wall varied from 1 to 4 mm. in thickness. The patient made an uninterrupted convalescence.

UNREDUCED ELBOW DISLOCATION.

Dr. William J. Taylor showed a skiagraph of an unreduced forward dislocation of the elbow taken three weeks after the accident, as well as a skiagraph taken the day following the reduction of the dislocation.

The patient was a young man of 29 who, while playing football, fell upon the ball, and as he fell another player running up behind accidentally kicked him on the lower end of the left