STATED MEETING, HELD DECEMBER 7, 1908.

Dr. Gwilym G. Davis in the Chair.

CARCINOMA OF PYLORUS; HOUR-GLASS STOMACH.

Dr. William L. Rodman presented a woman, 43 years of age, who had given the history of chronic gastric trouble since she was fifteen. Six months ago her dyspeptic symptoms returned in a more pronounced way than ever before. She vomited irregularly, usually every two or three days. Her stomach contents did not show excess of hydrochloric acid or presence of lactic acid. A tumor near the pylorus was made out. The symptoms and signs clearly indicated an hour-glass stomach and a skiagram demonstrated such a condition. The pyloric compartment was very small and the cardiac compartment very large. There was considerable gastroptosis.

Three weeks ago this patient was operated on, and a large tumor was found near the pylorus. The pyloric end of the stomach was adherent to the liver and the pancreas. She bore the anæsthetic badly, and it was thought best to limit the surgical interference to a gastrojejunostomy, as the cardiac compartment was so large and the pyloric so small that they were practically dealing with a dilated stomach.

She has never vomited since the operation and her improvement has been steady and uninterrupted. She now claims that she never felt so well in her life. This, Dr. Rodman was satisfied, was a case of cancer ingrafted on the base of an old ulcer.

PERFORATING TYPHLITIS.

Dr. Rodman presented a girl, aged 17 years, who was brought to him from Cape May, N. J., during a most pronounced attack of what was thought to be appendicitis. He saw her thirty-six hours after the onset of symptoms, which seemed to have followed eating peanut candy. Her pulse was 120, her temperature 103°, the rigidity of the right rectus muscle was most marked, and her pain was intense.

As soon as the abdomen was opened, thin pus and fæces were seen to be escaping from a hole in the cæcum about one inch from the base of the appendix. The latter was not free, but bound down in the mass of adhesions. The cæcum was very red, soft, and friable. He did not think it wise either to remove the appendix or to attempt to suture the opening in the cæcum. Therefore gauze drainage was made, one piece protecting the general cavity centrally, one passing downward to the pelvis, one upward towards the liver, one in the flank. The fifth piece led down to the opening in the cæcum. The superficial wound was not sutured. The Fowler position with Murphy's continuous irrigation was instituted at once after operation.

At the end of two weeks the pus and fecal discharge had ceased, and a second operation was done to remove the appendix. No perforation of the appendix was found, and it was easily removed in spite of the great amount of inflammation existing a fortnight previously. The wound was closed with tier sutures, and her recovery has been smooth and uneventful. This was evidently a case of typhlitis, rather than appendicitis. Dr. Rodman said that he had seen two or three other cases like it, each showing a marked perforation in the cæcum, in one of them as large as a quarter of a dollar.

SARCOMA OF THE BREAST.

Dr. Rodman presented a woman from whom a very large sarcoma of the breast was removed two weeks ago at the Presbyterian Hospital. It was a periductile sarcoma. Sarcoma of the breast is a rare neoplasm. He had operated upon but three cases in his life, two of these, strangely enough, in the last year.

S. W. Gross estimated that sarcomata comprised 8 per cent. of mammary neoplasms. Roger Williams examined 2300 cases and found that sarcomata comprised 3.8 per cent. Dr. Rodman had carefully examined the statistics covering 5000 cases of mammary neoplasms with the result that sarcomata comprise less than 3 per cent. of mammary growths.

Although a diagnosis of sarcoma was made in this case, a free axillary dissection was carried out just as in cancer of the breast. He thought that this should always be done, inasmuch as sarcoma not infrequently causes infection of the neighboring lymphatic glands.

PERFORATION OF FEMORAL ARTERY BY OSTEOPHYTE.

Dr. Rodman presented a man, aged 30, from North Carolina, who had suffered for fifteen years with disease of the right femur. There had been from time to time sinuses through which small pieces of dead bone were discharged. He came to the Presbyterian Hospital for treatment September 1. A few days afterwards another abscess formed; it was opened, nothing further being done. Within forty-eight hours afterwards he had hemorrhage from the popliteal. The wound was packed with iodoform gauze and the hemorrhage in this way controlled. Each time the packing was removed, hemorrhage recurred. The femoral artery was ligated under cocaine at the apex of Scarpa's triangle. This controlled the hemorrhage for a week, when another free bleeding occurred, presumably when the circulation was re-established. The femoral was again ligated under cocaine just below Poupart's ligament. The hemorrhage was controlled for another week. Recurring, it was deemed best to amputate the thigh. He almost perished from shock. After the limb was removed, two spiculæ were found, sharp as the prongs of a fork, sticking backwards in the popliteal space, which had cut both artery and vein across. The specimen presented shows clearly enough the injury to both vessels.

It is hard to understand why gangrene did not ensue. The femur was two and a half or three times its normal size, the result of chronic osteoplastic osteitis. The amputation was made in the upper third of the thigh. He has gained twenty pounds in weight and all of his septic symptoms disappeared promptly after operation.

OMENTAL CYST.

Dr. Rodman presented a girl, aged 17, who was operated upon three weeks ago in the Medico-Chirurgical Hospital for an enormous cyst of the abdomen weighing sixty pounds. It had been variously diagnosticated by different surgeons as a pancreatic cyst, an ovarian cyst, and as free fluid in the peritoneal cavity. She had been tapped three times, the fluid being clear and limpid as spring water. The tumor was beneath the parietal peritoneum, covered over by an additional layer of peritoneum, but superior to the great omentum. It had no pedicle at all. But a single vessel was tied, and that a small one. It shelled out as a walnut from its covering. The cyst was unilocular. Seemingly, it was a cyst of the omentum. No abdominal viscus was seen during the operation.

Her recovery was rapid and complete.

SARCOMA OF BREAST.

Dr. John Speese presented, for Dr. Jopson, a specimen of sarcoma of the breast, occurring in a colored woman fifty years of age, in which the macroscopic appearance suggested that of the cystosarcomata described by many German pathologists. Several cysts were present, the contents having undergone coagulation. Microscopic examination revealed a malignant growth of connective-tissue origin, consisting of great numbers of spindle cells. The glandular portions of the breast also showed evidences of hyperplasia, the epithelial cells being heaped up in the ducts and tubules, but not infiltrating the surrounding tissues.

HYPERNEPHROMA OF THE KIDNEY.

Dr. John H. Gibbon presented a man 54 years of age, who was received into the medical wards of the Pennsylvania Hospital on September 18, 1908, under the care of Dr. Stengel. Three weeks before admission he began to have pain in the upper right quadrant of the abdomen, which he stated was increased by taking food. At this time a distinct tumor was easily palpated below the costal border, and apparently was connected with the liver. There was nothing in the repeated urinalyses to suggest any inflammatory condition of the kidney. The patient's hæmoglobin was 55 per cent.; color index, 0.674; leucocytes, 4100; and his red cells 4,360,000. An X-ray plate was made but showed nothing. It was thought that the tumor was probably connected with the kidney. Ureteral catheterization was done by Dr. Stewart, and proved of great diagnostic value. The catheters were inserted in the ureters and the glasses attached at 11.45 o'clock; at 12.05 a four-grain capsule of methylene blue was given. At 2 P.M. the methylene blue appeared in the urine from the left ureter, and in the urine from the right kidney not until more than an hour later. The catheters were removed at 3.07, during which time there were excreted from the left kidney 97 c.c. of urine, and from the right 9 c.c. There was no pus in the urine and the patient had no leucocytosis.

An incision was made through the sheath of the right rectus

and the peritoneum overlying the tumor was divided. In separating the tumor from the surrounding tissues a projecting mass from the posterior surface was found, which was probably an extension of the disease beyond the capsule, so that its complete removal was made more difficult. The operator finally, however, was able to get completely around this mass, although it was densely adherent to the spine. The ureter and vessels of the pelvis were ligated separately and the tumor removed. There was considerable oozing from the large cavity left after removal of the tumor, and a gauze drain was inserted. No sutures were placed in the posterior peritoneum in this case. The anterior wound was closed excepting at the point of drainage. The patient stood his operation well and made a good recovery. He had an X-ray burn which has now healed. For a time he had œdema and tenderness in the posterior abdominal wall. This entirely disappeared, however, and he seems now in a fair way to make a complete recovery from his operation, although recurrence is to be expected.

The pathological diagnosis of the growth in this case was hypernephroma of the kidney.

SARCOMA OF THE KIDNEY.

Dr. John H. Gibbon presented a boy, four years of age, who was operated upon a year ago at the Jefferson Hospital. The case occurred in the practice of Dr. George T. Tracy, of Beverly, New Jersey, and was seen by Dr. Gibbon in consultation with Dr. E. E. Graham. The boy at that time had an enormous tumor involving his right kidney. This tumor was first noticed a few weeks before admission. It was large enough to be easily seen at a considerable distance. Because of the size of the growth the prognosis was particularly grave, nevertheless the patient's parents were anxious that operation should be done.

The child was given chloride of ethyl-ether anæsthesia, and the peritoneal cavity opened over the tumor. The posterior peritoneum over the tumor was then divided and the entire mass removed. There seemed to be no extension beyond a well-defined capsule. The tumor was delivered through the abdominal wound before the pedicle was ligated. After ligating the blood-vessels of the pedicle an attachment to the lower portion of the tumor came into view, which turned out to be composed of kidney substance, and extended across the spinal column to the opposite side, where it was attached to the other kidney. It was about the size of a little finger. The left kidney seemed normal in shape, and had a distinct pelvis. The connecting link passed to its lower pole. There was no evidence of any disease in this isthmus, which was then ligated and divided. The posterior peritoneum was closed and the abdominal wall closed in layers without drainage. After removal the tumor was split and the growth found to be one which completely surrounded the kidney but only partially involved this organ. It had apparently started from the suprarenal. The specimen is nearly as large as the child's head. The ureter and calices were normal in size. One calix extended into the isthmus which had been divided.

Pathological diagnosis of this growth was spindle-celled sarcoma.

The boy made a prompt and very satisfactory convalescence. About a month after his operation he passed some blood in his bowel movements. Since that time, however, he has steadily improved in spite of an attack of measles, of chicken-pox, and one or two attacks of croup. He has gained ten or twelve pounds in weight and is passing a satisfactory amount of normal urine. There is no evidence of any hernia at the site of the incision, nor is there any evidence of any recurrence of the trouble. The boy has a good color and seems perfectly well. These large sarcomata involving the kidney are peculiarly fatal, and recurrence after removal usually takes place promptly.

Dr. Henry R. Wharton thought it rather remarkable to have a child doing well a full year after an operation for sarcoma of the kidney. He recalled two similar cases in which recurrence took place within six months, proving fatal in a short time, and he had never had a case in which recurrence has not taken place sooner or later.

THE RESULT FIVE YEARS AFTER EXCISION OF THE HUMERAL HEAD FOR CONGENITAL SUBACROMIAL DISLOCATION OF THE HUMERUS.

Dr. John B. Roberts presented a boy, eight years of age, who was operated on for congenital dislocation of the left humerus at the Methodist Hospital five years ago.[1] The head of

[1] American Journal of the Medical Sciences, Dec., 1905.

the humerus was excised at that time. Examination shows the left humerus to be very much shorter than the right, but the motions of the arm as a whole are much more free than at the time he was seen previous to operation.

Measurements from the tip of the acromion to the external condyle are difficult to make with accuracy because of the boy's perpetual movements, but the right arm is apparently 9¾ in. in length from the points mentioned; the left, 7 in. The upper end of the humerus seems to move quite freely under passive motion made by the surgeon and there is marked grating.

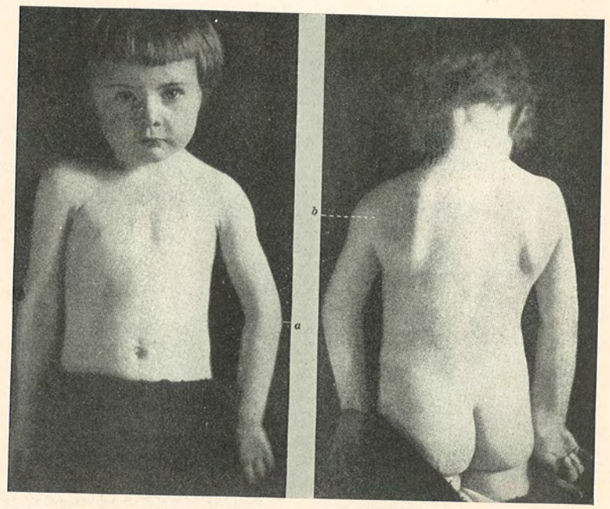
When the child places his left hand on his right shoulder or on his head the scapula, however, moves with the humerus. He can put his left hand on the opposite shoulder, on the top of the head, and on the back of his neck, and move it from the occipital region to the vertex without difficulty and without using the right hand to aid the left arm by lifting the elbow as he did originally. He cannot raise the left arm outward much above the horizontal line, though he can sling it higher than that.

Both arms hang at the side with the thumbs out and with the humerus quite near the chest. External rotation of the hand carries the thumb of the left hand nearly as far outward as on the right side. There is, however, no rotation made at the shoulder joint as on the normal side. The entire external rotation is in the forearm. The humerus can be rotated outward passively, but the little boy does not do it himself. It is a little difficult to get a true estimate of the ability to make the voluntary motions desired because of the boy's restlessness and inattention. The grasp of both hands is apparently the same, and the power of flexing and extending the elbow-joint seems alike on both sides. The biceps on the left side shows the abnormal swelling due to the loss of the proper attachment of one head, but the flexion of the elbow seems to be about as strong as on the other side. Supination of the hand is a little restricted.

The boy can bring the upper arm quite close to his ribs and as stated before can place the palm upon the neck and head with ease. He can pull his left ear and right ear, and can place the left hand readily behind him and touch the lumbar region with the back of the hand.

There is some atrophy of the muscles in the supraspinous and infraspinous fossæ of the scapula, as there is of the muscles of

FIG. 1.

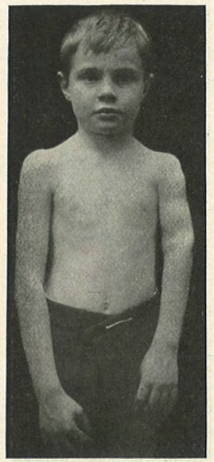


Congenital subacromial dislocation of the left humerus. Boy, aged three years. Observe abduction and inward rotation of humerus. Before operation. *a*, olecranon points directly outward and external condyle forward. *b*, head of humerus.

FIG. 2.

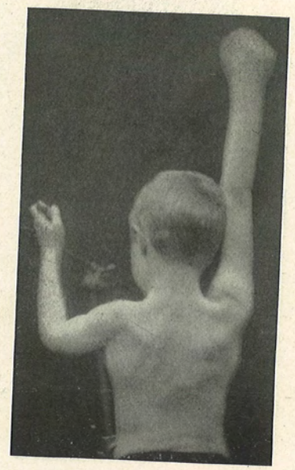
Excision of head of left humerus five years ago for congenital subacromial dislocation of humerus. Boy is now (Dec. 7, 1908) eight years old. Observe shortening of arm.

FIG. 3



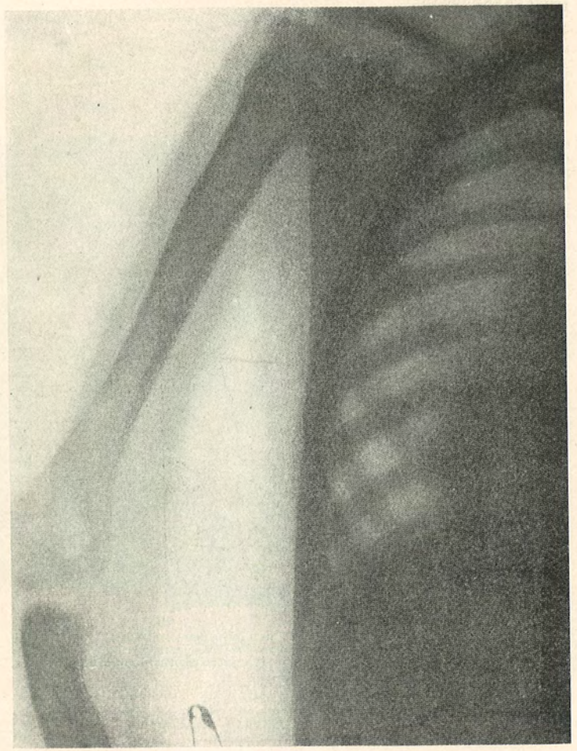
Excision of head of humerus five years ago for congenital subacromial dislocation of humerus. Boy is now (Dec 7, 1908) eight years old. Observe shortening of arm and the ease with which left elbow is carried near chest.

FIG. 4.



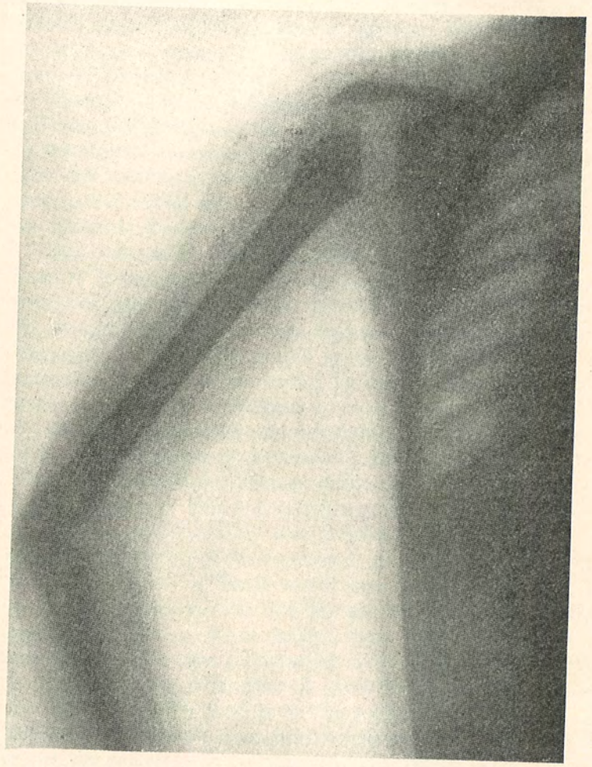
Hand on head rest is up as high as he can get it without twisting body. Before operation five years ago he could not raise left arm without aiding it with other hand.

FIG. 5.



Congenital subacromial dislocation of the left humerus before operation. Observe abduction rotation of humerus, shown by the elbow being held away from the thorax, with olecranon pointing outward.

FIG. 6.



Congenital subacromial dislocation of the left humerus, after excision of the head. Skiagraph taken about three months after excision of the head of the humerus. Observe the absence of abnormal rotation of the humerus, which is seen in the skiagraph taken before operation. The abduction of the humerus seen here is voluntary.

the forearm and upper arm. When he attempts to elevate the left arm, as in using the deltoid, he has to give it a swing, and the scapula moves with the humerus. He can then bring the arm up quite well, though he cannot retain it above the horizontal line.

There is little, if any, lateral spinal curvature.

There is shortening of the left clavicle, which from the sternum to the scapula measures 5½ in., whereas the left is 6 in. long. The ulna on the abnormal side appears to be the same length as that on the normal side, measuring 8¼ in. from the insertion of the triceps to the head of the ulna at the wrist.

Dr. Gwilym G. Davis said that the bulk of these luxations seem to be congenital, very likely produced at the time of birth, traumatic ones acquired after birth being comparatively rare. He thought the congenital cases are more common than is usually supposed. It is usually caused by the internal rotation of the arm, and it would be interesting to know whether in this case there was a history of difficulty in birth.

Dr. John B. Roberts said that these dislocations are supposed by many to be results of parturition. There have, however, been reported a few cases of bilateral dislocation, and several cases of the occurrence of this dislocation more than once in the same family. It seems unlikely that a child would get double subacromial dislocation of the humerus in parturition, or that two or three children in one family would have the same accident. He could not but believe that they are as much congenital as dislocations of the hip. Some believe them to be due to paralytic conditions of the arm produced at birth. They are interesting and deserve more study than is given them, for they are rare. Dr. Roberts believed them to be true congenital dislocations. He had seen but two such cases, the one operated upon and another in which the patient's friends objected to operation.

FRACTURE OF THE PELVIS WITH RUPTURE OF THE ABDOMINAL WALL.

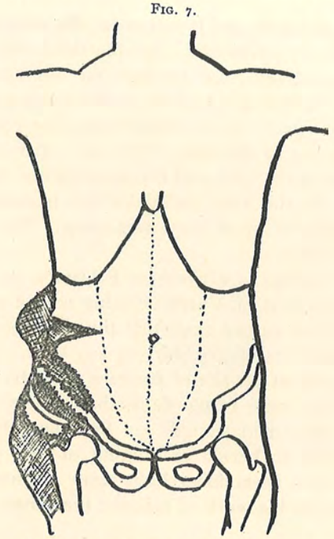
Dr. Astley P. C. Ashhurst reported the case of a man, 26 years of age, who was admitted to the Episcopal Hospital, in the service of Dr. Davis, Jan. 1, 1908. He had been caught between two trains, his pelvis having been crushed laterally. There was no marked shock on admission. There was a comminuted frac-

ture of the crest of the right ilium, from the region of the anterior superior spine backwards for about four inches, the larger fragment being about two inches in breadth and four inches long. There were no particular symptoms of intra-abdominal injury. Urine drawn by the catheter was clear. There were numerous abrasions and contusions, and there were several immense hæmatomata in the subcutaneous tissues of right flank, external iliac fossa, right buttock, upper part of thigh, sacrum, and lumbar spine. Below the right costal border a rent in the abdominal muscles was clearly palpable through the skin, which was nowhere perforated. As the hæmatomata steadily increased in size, it was determined to attempt the repair of the abdominal wall and the replacement of the fractured bones, and to exclude intra-abdominal injury by exploration.

Accordingly, at midnight, four hours after the injury, a transverse incision was made at the level of the umbilicus, over the most evident seat of injury. This incision extended from the right semilunar line outward for three or four inches. Over a pint of fluid and clotted blood was evacuated, and a large and ragged rent was found in the oblique and transversalis muscles of the abdominal wall, with the lower intercostal nerves, apparently intact, spanning the gap like fine silken threads; a coil of gut, covered only by the parietal peritoneum, bulged into the wounded area. The peritoneum was opened, and two fingers inserted for exploration at once caught hold of a long, thick, and rigid appendix, which was drawn out for inspection: The appendix was not inflamed, but contained a firm concretion near its tip, and its lumen was distended with fecal matter of the consistence of putty, thus accounting for its rigidity. The appendix was removed. A gauze sponge, passed into the pelvis, found no evidence of blood or fæces, so the peritoneum was closed. The rupture in the transverse muscles was repaired in layers, by buried sutures of chromic gut, and the skin incision was then enlarged at right angles to the first, downwards over the site of the fracture of the pelvis. Here the oblique muscles were found completely detached from the crest of the ilium, and the iliacus also was torn loose from the internal iliac fossa for two inches towards the sacro-iliac joint. The whole crest of the ilium was broken loose, and was drawn downwards and outwards on to the buttock, by those few fibres of the glutei muscles which had not themselves

been ruptured. Much liquid and clotted blood was evacuated from this region also. The displaced fragments were pulled back to their normal relations, and were held there by passing interrupted mattress sutures of heavy chromic catgut, by means of a Reverdin needle, from the gluteal muscles below, through the remains of periosteum and muscular tissue on the crest of the ilium, and up through the oblique muscles of the abdominal wall,

FIG. 7.



Fracture of crest of right ilium, with rupture of the abdominal wall. (Shaded area represents hæmatomata.)

and then back again to the starting point in reverse order, so that when these mattress sutures were pulled tight and tied, they drew the gluteal muscles up from below, and the oblique muscles down from above, and thus fixed the iliac crest with reasonable security between the two. Drainage from the fractured area was provided for by a rubber tube and two pieces of gauze. The superficial fascia was sutured with buried sutures, and the skin with silk-worm gut. Finally, an incision was made over the hæmatoma in the kidney region, and this was drained by a rubber

tube. No attempt was made to evacuate all the blood in the various hæmatomata, as to do so would have required incisions all down the thigh as well as over the sacrum. Yet the sound of the liquid blood splashing about in these cavities was sufficiently alarming as the patient was lifted off the operating table, the admission of air to the cavities making the sounds very audible even across the room. The duration of the operation was fifty minutes.

The patient did well, and it was noted the next day that there was no pain except on motion. By the third day all the other hæmatomata had drained out through the one opening. Three weeks after the operation (Jan. 21, 1908) there was high fever, and considerable constitutional disturbance, due to the damming up of a hæmatoma in the loin. This was opened through the original incision in the loin, and the temperature reached normal the next day. At this time the abdominal incisions were practically healed, only a small sinus remaining. The bone seemed firmly fixed in place.

The patient sat up in a chair on February 17, and was discharged about the first of March, walking with a moderate limp. He has been an out-patient since that time, and now walks without any limp, and has no disability of any kind. A small sinus, due to slight caries at the site of fracture, persists, but it requires to be dressed only once in ten days, there being almost no discharge. The abdominal wounds are firm, and there is not the slightest tendency to hernia or bulging of that portion of the abdomen. He has been doing light work all summer, but has not yet returned to his work of railroad brakeman.

EXTRAPERITONEAL RUPTURE OF THE BLADDER, WITHOUT FRACTURE OF THE PELVIS—TWO CASES.

Dr. Ashhurst related the histories of the following two cases:

Case I.—Archibald McD., aged 43 years, was admitted to the service of Dr. Davis, Jan. 30, 1908. While at work, in a stooping posture, he had been struck across the right loin by a falling telegraph pole, and was crushed to the earth. On admission he was seen by Dr. Davis; at this time there was moderate shock (temperature, 97.2° F.; pulse, 88; respiration, 32), and it was ascertained that two ribs on the right were fractured; there

Fig. 8.

Fracture of pelvis with rupture of abdominal wall. Counter-incision in loin to drain hæmatoma.

were no other symptoms. About five hours later, signs of internal hemorrhage began to be evident, the patient having recovered from his shock. There was great tenderness over the right kidney region, and some abdominal rigidity. Nearly pure blood, with no clots, was drawn by catheter. Small amounts of boric acid solution injected by the resident into the bladder were all recovered. (Later it was learned that only two ounces at a time had been injected.) Examination at this time showed evidences of deep hæmatoma in the right lumbar region, with swelling, dulness, and marked tenderness. Dr. Ashhurst thought it probable that there was an extraperitoneal rupture of the right kidney.

Operation at 9.45 P.M., about eight hours after the injury. An oblique right lumbar incision was made, retroperitoneal; a moderate-sized hæmatoma was evacuated from among the lumbar muscles, but the kidney when brought into the wound was found to be uninjured. The lumbar wound was closed without drainage. The patient was turned over on his back, and a hypogastric incision through the right rectus muscle was made. Free extraperitoneal hemorrhage was found in the space of Retzius, but it was decided to explore the other kidney and the ureters as a matter of precaution. The peritoneum was therefore opened: the intestines were normal, and there was no free fluid; the left kidney was found normal on palpation, and no evidence of intraperitoneal injury could be discovered. There was a large hæmatoma in the extraperitoneal tissues of the *left* pelvis and the *left* iliac region. The median hypogastric incision was closed without drainage; and a third incision was made through the left rectus muscle, close to the pubic bone, opening the extraperitoneal hæmatoma, which seemed to have its origin around the neck of the bladder and the prostate, though no definite rupture of the bladder could be found. A catheter passed by the urethra showed the bladder to be empty, and no rupture could be brought to view. The oozing areas around the neck of the bladder were packed with iodoform gauze, and the bladder was opened at its dome, was stitched to the abdominal wall, and drained by a large rubber tube. The operation lasted one hour. During most of it the patient was pulseless, and only by the use of saline solution intravenously did he leave the operating room alive.

The next morning the patient appeared to have some chance of recovery; four ounces of nearly clear urine had drained from

the bladder, and there was very little hemorrhage from the pelvic tissues. Up to the time of death, twenty-nine hours after operation, eleven more ounces of urine drained from the bladder, or fifteen ounces in all since the operation. As there was no further bleeding, and no evidences of peritonitis, death was attributed to shock.

CASE II.—Fred S., aged 20 years, was admitted to the service of Dr. Frazier, Nov. 23, 1908. While driving a wagon it rolled down an embankment, killing one of the horses, and crushing the patient. On admission there was considerable shock (temperature, 97° F.); there was inability to pass urine, and pure blood was drawn by the catheter. It was impossible to recover any fluid which was injected. There was great abdominal pain and rigidity, with dulness in the flanks, which seemed to be varied by the position of the patient. There was dulness in the suprapubic region, and no change was produced in this dulness by injections through the catheter. No fracture of the pelvis could be demonstrated even by rectal examination. On account of the great abdominal rigidity and tenderness, with the doubtful movable dulness in the flanks, it was considered wise to explore the abdomen, though the diagnosis of intraperitoneal rupture of the bladder was not definitely made.

A median hypogastric incision was made six hours after the injury. There was blood in the space of Retzius, and on opening the peritoneal cavity a little bloody fluid was found. This came from a rent of the bladder, involving the serous coat only, to the left of the middle of the posterior wall. This area was sutured with a continuous Lembert suture of linen. The lower angle of the peritoneal incision was closed, and a gauze drain from the pelvis was brought out of its upper angle. Then, through the same hypogastric wound, but extraperitoneally, the bladder was detached from the pelvic wall, and liquid blood and clots were evacuated from the extraperitoneal region to the left of and in front of the bladder. No bleeding points could be detected, and no definite rupture of the bladder could be found. Two gauze packs were placed to the oozing area around the triangular ligament and neck of the bladder, both extraperitoneally. The bladder was then opened, and bloody urine escaped; the end of the catheter in the urethra could not be felt within the bladder; evidently it had passed into the hæmatoma to the left of the bladder,

through a rupture in the neighborhood of the prostatic urethra. The bladder was drained by a rubber tube, through the suprapubic wound, and the middle of the abdominal incision was closed, leaving the peritoneal drain emerging at the upper end and the extraperitoneal and bladder drainage emerging at the lower end. The time of the operation was forty-five minutes.

The patient rallied well from the operation, but died in twenty-four hours with uræmic symptoms (restlessness, delirium, slight dyspnœa, etc.); there were no symptoms of peritonitis. Examination of the wound after death showed no fluid in the peritoneal cavity, no inflammatory lymph, no adhesions, and no injury to any viscera except bladder. There had been no more hemorrhage from the extraperitoneal region where the rupture of the bladder was supposed to be. No fracture of the pelvis was detected.

Dr. Ashhurst said that in order to gain some idea of the mortality and complications of cases of fracture of the pelvis, he had searched the records of the Episcopal Hospital from Jan. 1, 1895, to Dec. 1, 1908. During that period there had been treated in the wards 57 patients with fracture of the pelvis; 18 of these patients died, a mortality of 31.57 per cent. Of these 18 fatal cases, there were no visceral injuries in 8, death in most of these cases being due to other injuries (crushes of the extremities, fractures of the skull, etc.). There were 10 cases complicated by visceral injury, as follows:

	Cases.	Recovered.	Died.
Rupture of the urethra	4	1	3
Extraperitoneal rupture of bladder	4	1	3
Rupture of undiscovered portion of urinary tract	1	0	1
Rupture of liver	1	0	1
	10	2	8

In addition to the above cases of extraperitoneal rupture of the bladder, there had been treated 3 other cases (all fatal) without fracture of the pelvis, including the two cases reported by Dr. Ashhurst to-night. Among the entire series of 7 cases of extraperitoneal rupture of the bladder, only one patient recovered (see Case VI in appended list).

As to the relative frequency of intraperitoneal and extraperitoneal ruptures of the bladder, it was generally stated that

the latter were much rarer, forming only 10 to 20 per cent. of all cases of rupture of the bladder; and this statement had been made by Dr. Ashhurst himself, in publishing statistics of 110 cases of intraperitoneal rupture of the bladder treated by laparotomy (*Amer. Jour. Med. Sc.*, 1906, ii, 17). But as he had found only 3 cases of intraperitoneal rupture at the Episcopal Hospital, to 7 cases of extraperitoneal rupture, he was inclined to think the rarity of the latter had been overestimated. It must be acknowledged, however, that in many of these, as in most other cases of extraperitoneal rupture reported, no definite rupture had been found, the diagnosis being based on the presence of bloody urine both inside the bladder and in the extraperitoneal pelvic tissues.

In regard to ruptures of the abdominal wall from crushing force, they must be acknowledged to be extremely rare. Besides the case now reported, where there was also fracture of the pelvis, only one other case had been found at the Episcopal Hospital since 1895. This was in a patient of Dr. Neilson's (C. W., 23 yrs., April 24, 1900), who also had extraperitoneal rupture of the bladder, but no fracture of the pelvis. Although the abdominal wall was repaired as well as possible, death occurred the next day.

CASES OF FRACTURE OF PELVIS COMPLICATED BY VISCERAL INJURY.

(Episcopal Hospital, Phila., 1895–1908.)

I. *Fracture of Rami of Pubis and Ischium, Rupture of Urethra.*—Frank D., 29 yrs. Adm. March 26, 1896. Treated by catheterization. Recovered.

II. *Fracture of Pelvis, Fracture of Skull, and Rupture of Urethra.*—John B., 23 yrs. Adm. March 1, 1897. Developed emphysema of abdominal wall, and peritonitis. No operation. Died in 2 days.

III. *Compound Fracture of Ilium and Pubes, Rupture of Urethra.*—Chas. P. M., 22 yrs. Adm. May 24, 1905. Railroad crush. All muscles of thigh and buttocks completely torn out. Bleeding from urethra. Wounds packed. Catheter in urethra. Died in 2 days.

IV. *Fracture of Left Pelvis, Rupture of Urethra, Dislocation of Left Femur, Rupture of Left Lung.*—Frank K., 32 yrs. Adm. May 9, 1907. No operation. Died in 1 day.

V. *Compound Fracture Left Ilium, Extraperitoneal Rupture of Bladder, Rupture of Femoral Vein.*—Alfred M., 25 yrs. Adm. Aug. 27, 1903. Existing wound enlarged by resident, Dr. Havens, femoral vein ligated, extraperitoneal pelvic tissues packed. Died in 2 hours.

VI. *Fracture of Pubic Ramus, Crush of Left Leg, Extraperitoneal Rupture of Bladder.*—James B., 23 yrs. Adm. Oct. 8, 1903. Leg amputated on admission; bloody urine by catheter, but no other pelvic symptoms. Two weeks later, a fluctuating swelling in left groin was opened by Dr. Hutchinson, urine and blood evacuated from extraperitoneal pelvic tissues, and rupture in anterior wall of bladder found. Bladder drained by tube. Recovered.

VII. *Fracture of Rami of Pubis and Ischium, Both Sides; Extraperitoneal Rupture of Bladder.*—Frank B., 46 yrs. Adm. Sept. 2, 1907. No operation. Died in 4 hours.

VIII. *Fracture of Descending Ramus of Right Pubis, Hæmatoma in Space of Retzius.*—Harry F., 48 yrs. Adm. May 17, 1908. Operation by Dr. Neilson 24 hrs. after injury. Peritoneum opened, intestines punctured for flatus, no obstruction found. Extraperitoneal pelvic tissues packed to control hemorrhage, possibly from obturator artery. Blood in urine; but no definite rupture of bladder found. Died in 7 hours.

IX. *Fracture Near Right Sacro-iliac Joint; Perhaps Rupture of Ureter.* Adam M., 59 yrs. Adm. Aug. 14, 1905. Fell 35 feet. Fluid injected into bladder all recovered. Operation by Dr. Deaver, 7 hours after injury. Free fluid, mostly urine, in peritoneal cavity; no rupture of bladder. Then right lumbar incision, no rupture of kidney found, none could be found in ureter or its pelvis. Packed. Died in 12 hours.

X. *Fracture of Right Pelvis, Rupture of Liver.*—John F. McG., 24 yrs. Adm. March 26, 1906. Symptoms of internal hemorrhage. Patient refused operation for 24 hours. Then operation by Dr. Davis; pint of free blood in peritoneum, large laceration in liver packed; sponged dry. Did well for 2 days, then developed peritonitis, and died on 5th day.

AN APPARATUS FOR THE INTRODUCTION OF SALINES INTO THE RECTUM.

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THE plan of the apparatus here presented is the outgrowth of observations of the various methods of administration of the Murphy treatment. Inquiries have also been made into the method generally employed; and while all have for their common end the slow continuous introduction of salt solution into the rectum, there is a great divergence regarding many of the smaller details of technic.

The matter of regulating the relation between the intra-abdominal pressure and the hydrostatic pressure in the apparatus employed is by no means an easy one, when economy of time and the labor of nurses in the crowded wards of a hospital are to be considered. It is stated in the directions for treatment that the hydrostatic pressure be slightly in excess of the intra-abdominal pressure. If the reservoir employed for holding the salt solution be placed at such an elevation that the two pressures be alike, then there will be no flow. If now the reservoir be placed one inch higher the external pressure will be the greater and the flow will begin. Since only a comparatively few minutes are required for the salt solution to lower itself one inch, it follows that the two pressures will again be similar and the reservoir will again require elevation; in other words, almost constant attention is necessary if this nicety of adjustment of pressures be kept in mind.

Another observation which will be more fully explained on the basis of some physical experiments will show that as ordinarily given the salt solution enters the rectum after the first half-hour of administration at a temperature only slightly above that of the room.

With these things in mind it was my object to design an apparatus from which the flow could be controlled in a manner which would not interfere with the quick passage of flatus or the sudden expulsion of salt solution back through the tube and from which the fluid would enter the rectum at a temperature ranging from 100° to 115° F. Many forms of mechanism might be devised which would fulfil the above-mentioned conditions perfectly. Thermostatic regulators, "Thermos" reservoirs, etc., have been suggested, but in the administration of a treatment so widely used as that laid down by Murphy it is essential that the apparatus be as inexpensive as is consistent with fair work. To aim too strenuously toward perfection would make the cost prohibitory. It is not unusual in a large hospital to see as many as six patients at a time receiving continuous proctoclysis.

In order to get accurate data on the subject of heat radiation some laboratory experiments were done. To this end an improvised apparatus consisting of a reservoir surrounded by a chamber for holding a warming fluid was used. An attempt was made to keep the water in the reservoir at a fairly constant temperature and accurately to record the temperature of the fluid as it emerged from the end of the tube. The tube was four feet long and three-eighths of an inch in diameter. In the first experiment the fluid in the reservoir was kept at a temperature never above 130° F. nor below 124° F. and the rate of flow was regular, 350 cubic centimetres per hour. The temperature of the water at the end of the tube was obtained by having a thermometer bulb placed within its lumen, and readings were taken every ten minutes. Beginning with 129° F. they were as follows: 120° F., 92° F., 86° F., 84° F., 83° F., 82° F., 80° F., 79° F., 78° F., 80° F., and 78° F. From this it will be seen that at the end of two hours the temperature had dropped from 129° F. to 78° F.; in other words, it dropped to within two degrees of room temperature.

In a second experiment the same apparatus was used and temperatures were taken at the exit every ten minutes, the

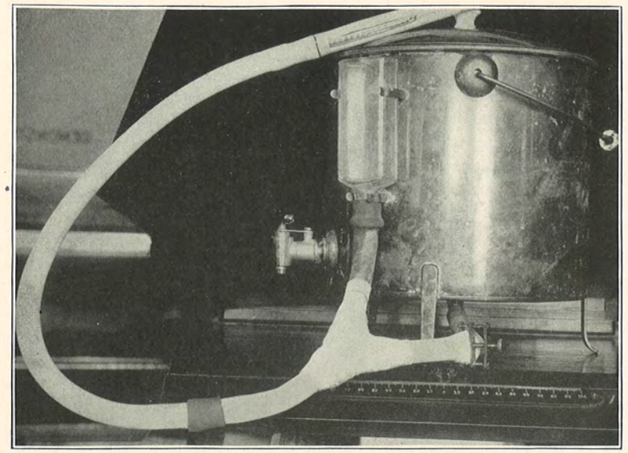
rate of flow being 400 cubic centimetres per hour. The reservoir stood at 129° F. and water was emerging at 110° F. At the end of fifty minutes the same readings were 100° F. and 86° F. respectively.

In a third experiment an irrigating bottle was filled with water at 185° F. and the whole was placed in a basin of constantly boiling water. A tube four feet long was used and the rate of flow was 400 cubic centimetres per hour. The first thermometric reading at the distal end of the tube was 176° F., and in twenty-five minutes it had dropped seventy-six degrees. The room temperature was 74° F.

A fourth experiment was conducted to meet as nearly as possible the directions given by Murphy in the June, 1908, number of *Surgery, Gynæcology, and Obstetrics.* In an irrigating bottle was placed water at 120° F. On either side hot water bottles at 180° F. were suspended. The distal end reading began at 100° F. and in one hour it had dropped to 81° F. The rate of flow was 500 cubic centimetres per hour and the reservoir remained at 120° F.

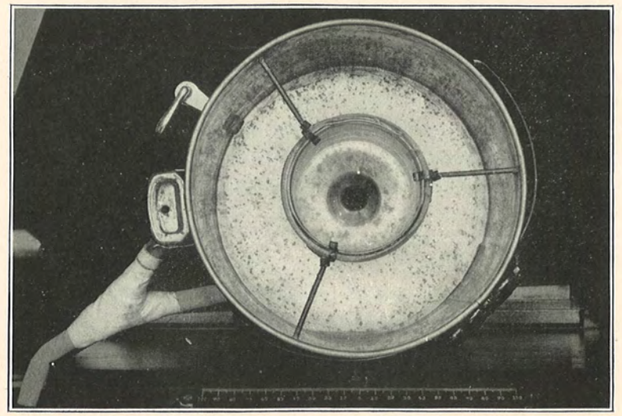
From these results it will be seen that not only must the water in the reservoir be kept at a higher temperature than is usually employed, if water at 100° F. to 110° F. be desired to enter the rectum, but some advantage must be taken of a means to prevent radiation from the tube. To meet this a tube was constructed which consisted of an inner tube wound with asbestos and over this a larger tube was placed enveloping completely the inner tube and its windings. The asbestos was used to prevent the two tubes from coming into contact and to entangle within its substance an air space. With the use of such a tube and the apparatus about to be explained the results were striking. Salt solution after running at a rate of only 300 cubic centimetres per hour was entering the rectum at 115° F. at the end of the first hour, 110° F. at the end of the second hour, and 92° F. at the end of the third hour. The solution was placed in the reservoir at 140° F. and was surrounded by boiling water. No change was made in either of the waters until the end of the third hour. If the

FIG. 1.



An apparatus for the introduction of salines into the rectum. Side view.

FIG. 2.



An apparatus for the introduction of salines into the rectum. Top view.

warming fluid had been changed the second hour the solution would have entered the rectum not lower than 105° F. The experiment just referred to was done on a patient and continued from 2 P.M. until 2 A.M. It was conducted by pupil nurses of the Germantown Hospital Training School. The rate of flow was controlled by a pinch-cock on the proximal end of the tube. The salt solution was renewed only twice and the warming fluid only three times. The rate of flow was as slow as 250 cubic centimetres per hour (a condition most favorable to heat radiation); and only once did the fluid at the thermometer at the distal end of the tube register as low as 92° F. Salt solution stained with fecal matter was expelled back into the shunt reservoir from time to time as the patient would cough, or strain from the pains of an existing acute pyosalpinx.

A description of the apparatus as per accompanying photographs is as follows:

A copper bucket provided with legs on which to stand it, a handle by which it can be hung, and a lid for prevention of excessive heat radiation has in its bottom a central opening and on its side a faucet.

Through the central opening passes the curved nozzle of a graduated litre glass chamber. This is supported and made to press firmly against a rubber washer which surrounds the hole in the bottom of the bucket by a frame and movable fasteners. In this manner a warming fluid is held within the bucket and made to surround the reservoir which contains the salt solution by a layer of water two and one-half inches thick. This can be quickly changed by running it off through the faucet and pouring boiling water in the top.

The tube is constructed throughout as above explained; that is, two tubes with a layer of asbestos between. One foot from the proximal end a Y-tube is interposed, and just proximal to the Y, and on the tube running from the reservoir, a pinch-cock is placed in order that the flow may be controlled. On the other proximal end of the Y is placed a shunt tube which fastens to a receiving bottle provided with an opening

in either end, and attached to the side of the bucket. In this manner the flow can be exactly regulated and at the same time the salt solution or flatus can be easily expelled. This has worked very successfully in actual experiment on patients. There is allowed a to-and-fro movement of the fluid as easily as if no pinch-cock were used. From the distal end of the Y the tube continues to within seven inches of the rectum, at which point an enclosed thermometer is interposed. This in itself not only records the temperature, but it serves as a guide to the rapidity of the flow. If the flow be too slow the mercury falls and if it be too rapid the mercury rises. The tube is three and one-half feet long and is so constructed that a flow of from 400 to 500 cubic centimetres per hour will enter the rectum at 105° F. to 115° F., provided salt solution be placed in the reservoir at 140° F. and the warming fluid be used at the boiling point. The tube should not be over three and one-half feet long. This permits the placing of the apparatus at or near the foot of the bed. The warming fluid should be changed every two hours.

Directions for Use.—Fill the warming chamber with boiling water. Fill the reservoir with salt solution at about 140° F. Open the pinch-cock and allow the fluid to flow freely until the tube is well warmed. Close the pinch-cock until about two drops per second are flowing. To judge this hold the rectal tube point upward not more than four inches below the level of the water in the reservoir; otherwise one will be deceived by the rapidity with which the tube will empty itself distal to the stop-cock when the rectal nozzle is held too low.

Place the rectal tube—of the type directed by Murphy—in the rectum and strap to the inner surface of the thigh. Place the apparatus on an adjustable stand or tree, four to ten inches above the level of the anus.

If salt solution be expelled into the bed or back into the shunt bottle the apparatus may be lowered and the rate of flow slightly decreased. If the patient persists in expelling the solution discontinue the treatment for one hour and then proceed as before.

I wish to make known my indebtedness to Drs. A. D. Whiting and George Lord de Schweinitz for criticisms and for the use of clinical material in the wards of the Germantown Hospital, and to Mr. Keen, of Chas. Lentz & Co., for this trial apparatus constructed for my use.

DR. A. D. WHITING said there are two or three advantages of this apparatus. One is that the rapidity of the flow can be regulated very readily by means of the pinch-cock. Without the shunt there is no way for the patient to relieve himself of gas, and if the bowel becomes distended by the solution not being absorbed there is bound to be contraction of the muscle and expulsion, if there is not some way by which the solution can flow back. It can readily be seen that this prevents the soaking of the bed. There is always free circulation and the gas can be seen passing into the bottle, and very often colored solution coming back from the rectum. One of the most important things is the tube, which prevents to a great extent the reduction in temperature of the solution. As employed at the Germantown Hospital the temperature of the solution as it enters the rectum has ranged from above 90° to 105° for two or three hours, and the benefit to the patient is much greater than if a cooler salt solution is given.

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