without decapsulation, which I had to do, and then found it could not be delivered owing to adhesions about the pelvis. The ureter was natural in size and feel, and was followed up through a constriction in the surrounding tissues to a dilated part in these tissues occupied by a distended pelvis. The sudden transition was very marked. The posterior part of the ring was divided and found to be of fibrous tissue. Only the anterior limit was formed by two large blood vessels and they clearly formed the main obstruction and corresponded to the junction of the pelvis and ureter. The two vessels were clamped, tied, and divided. They entered the lower pole of the kidney and apparently came from the main renal vessels. Owing to the length of the ureter, size of the pelvis, and the adhesions around them, the division of the vessels did not entirely obliterate the kink. As the kidney was returned into its bed the kink became quite marked. I therefore tried to straighten out the ureter by sewing it to the lower part of the kidney, but as this did not seem satisfactory I performed an anastomosis after Finney's method of gastro-duodenostomy, and this proved very satisfactory. A large quantity of pus was evacuated. It was interesting to see the pus find its way down into the ureter directly the constriction formed by the blood vessels was divided and the ureter was straightened out. The wound was sewn up with mass salmon-gut sutures and a tube was placed at the posterior angle of the wound. The kidney capsule was still fixed in good position at the end of the operation, and this maintained the decapsulated organ also in a good position. It was considerably inflamed, and it showed white spots in the cortex, probably indicating small foci of suppuration.

The patient made an uninterrupted recovery, the wound healing primarily in spite of the pus evacuated at the operation.

CASE VII.—*Abnormal Artery Causing Obstructed Ureter and Stone in Left Kidney.*

G. L., aged 12 (in Guy's Hospital), had had haematuria and pain on and off in the left loin and flank for two years. X-ray examination revealed a stone in the pelvis of the left kidney.

Operation (February 4th, 1916).—The usual oblique incision was made in the loin. The kidney was difficult to bring up owing to an abnormal artery entering the lower pole. It clearly constricted the ureter just below the pelvis, and was divided. The pelvis was dilated and inflamed, with adhesion of the fat to it. I incised it and removed a stone the size of a filbert. It was a very spiky and heavy oxalate calculus. The incision in the pelvis was accurately closed with fine catgut, and the fatty connective tissues behind the pelvis were sewn over the incision. A tube was left at the posterior angle of the parietal wound for two days, but no urine escaped, and the patient made a rapid recovery.

CASE VIII.—*Left Hydronephrosis: Abnormal Renal Artery.*

Lieut. H., C.A.M.C. (Sussex Lodge Hospital for Officers), had had repeated attacks of colic in the left flank for the last ten years or more. He was in Sussex Lodge Hospital about eighteen months ago. X-ray examination revealed no stone; there was no tenderness over the kidney and no colic developed. Therefore an operation was not advised. The patient went to a convalescent home. The doctor there thought he had an ileal kink, and sent him to another surgeon, who made a very long incision in the abdomen, found the appendix normal, and said he released an ileal kink. The attacks continued. The patient was sent to Sussex Lodge again for observation, and one day, when I happened to be there, he had the pain; the left kidney was palpable, and he was very tender both in front and behind. Therefore I advised operation, having diagnosed an obstructed ureter, possibly due to an abnormal artery, a small calculus, or a valve.

Operation (January 8th, 1917).—The usual oblique incision was made. I found a large hydronephrosis (the pelvis being the size of an orange), caused by an abnormal renal vein passing from the main renal vein downwards behind the ureter at its origin, and then forwards to the lower pole of the kidney. On dividing this it was noticed that the ureter was narrowed at its origin. Therefore, to make quite sure of effecting a cure, an anastomosis was made between the back of the pelvis and the ureter an inch down. A catheter had previously been passed along the ureter into the bladder without any difficulty, and a finger had been introduced into the pelvis and calyces without finding any stone. The exploratory opening in the back of the pelvis was used for the anastomosis. Fine catgut was used. It was noticed that the ureter in its upper two inches was inflamed and dilated, and it appeared probable that under certain conditions the artery constricted the ureter below this dilated part, but that it slipped up as the pelvis became more distended. The patient made a good and rapid recovery.

REFERENCE.

¹ *Surgical Diseases of the Kidney and Ureter*, vol. ii, p. 297, Figs. 141 and 142.

HARVARD UNIVERSITY has accepted an offer of £4,000 a year for three years from the American National Canners' Association to be applied to the investigation of food poisoning with special reference to canned goods. The university has made it a condition that the investigation, which will be under the direction of Dr. M. J. Rosenau, professor of preventive medicine and hygiene, shall be conducted with entire academic freedom and the results published.

THREE CASES OF URETERAL OBSTRUCTION.*

BY

CAPTAIN G. S. GORDON, C.A.M.C.

I HAVE the honour to present three cases of obstruction to the flow of urine through the ureter. As Moore Barracks Canadian Military Hospital, which accommodates only 1,000 patients, supplied all three of them at one time and from material which had been passed as "fit," this condition can hardly be ranked as a surgical curiosity—it is really one of general interest. In many instances the difficulties in the way of making a diagnosis sufficiently complete to warrant operation are insuperable without instrumentation of a special order, and I venture to put forward a plea for full professional recognition of such special means.

Case 1, Pte. McC., aged 21, was sent to me by Captain Wickham, with full notes. He complained that at times, for seven years, he had had pain in the left side of the abdomen and in the left loin, usually associated with exertion or cold weather. The pain was disabling, and the attack would last from four hours to three days. It was sometimes accompanied by vomiting, but not by urinary symptoms, sweating, or diarrhoea. As the attack subsided, however, urination became abnormally frequent. There was difficulty in starting the flow, and pain in the glans penis till it did start; the urine at these times was noticed to be "muddy."

Amongst the remedies tried before entering the army was appendectomy. Since enlisting he had carried on in spite of his intermittent handicap, till finally he had to parade sick, when he was sent from France to England as a case of acute nephritis. He spent seventy-two days in one hospital, where acute pleurisy was added to the previous diagnosis. After thirty-six days at a convalescent hospital he began light duty in his lines, but could not "stick it out." Finally, he was sent to Moore Barracks Canadian Hospital with recurrence of pain in the left side. The laboratory report was to the effect that pus and blood were present in the urine, and the x rays report that there was "no stone in the urinary tract." Pulse, temperature, and respirations were normal. Examination of the heart and lungs and abdomen yielded no evidence of any abnormality.

When I first saw him the bladder was normal to cystoscopy. The urine from the left kidney contained pus, and was cloudy but colourless. The urine from the right was free from pus, translucent, and of a deep amber colour. It contained eight times as much urea as the left; no information was elicited on palpation of the abdomen, or over the kidneys behind.

At operation the left kidney was found to be a mere shell, with an enlarged pelvis, over which the upper end of the ureter coursed, and to which it was attached for an inch and a half by fibrous tissue. An excellent semi-diagrammatic sketch by Captain F. St. John is shown in Fig. 1.

The specimen shows how obstruction of the ureter occurred and the cause of the pain. This renal pelvis filled tensely with urine at times, and acted as an external ball valve to the ureter. Tension caused the pain characteristic of parenchymatous organs put on the stretch. This man would naturally consult a physician only when pain in the side was present; this pain had not the generally recognized characteristics of renal colic; there would be a rise in temperature, and the urine would be

FIG. 1.

* Read before the Canadian Army Medical Society at Shorncliffe, England.

free of pus during the attack, because all he would void would come from the unobstructed right ureter. The diagnosis was pleurisy at one time. The kidney and sac were removed, as they were worse than useless. In a case in which the kidney seemed worth saving, a plastic operation to remove obstruction would be indicated.

Case II, Pte. C., aged 22 years, had complained for only one week of undue frequency of urination with urgency almost to incontinence, night and day, and a burning sensation down the urethra for a few moments after voiding. He was suffering from a dental abscess as well, and after this was lanced the urinary symptoms diminished. The urine contained pus and staphylococci. On cystoscopy the mucous membrane of the right ureter was prolapsed, resembling a small pink oblong balloon, at one time tense and globular, at another partially collapsing, somewhat suggestive of the movement of a slug. Fig. 2 illustrates the condition.

FIG. 2.

The hydraulic pressure in the ureter required to force urine through the small orifice had bulged the lining of the ureter into the bladder, carrying with it the ureteral meatus, had coincidentally dilated the ureter itself and the renal pelvis, and had caused atrophy of the medulla of the kidney and gradually stretched the renal capsule. As a symptom of this condition a woman patient of mine with prolapsed ureter had pain over the kidney, but she was older, had borne children, and the colon bacillus had got a foothold. The pain ceased after a ureteral meatotomy was done through a cystoscope. In Case II one is inclined to think that the prolapsed ureter with dilatation was present without symptoms until the dental abscess freed staphylococci into the blood stream, and then the handicapped kidney and ureter were invaded. The ureteral orifice became smaller with congestion, more prolapse occurred, and the acute condition gave rise to symptoms.

The meatus of the ureter was split up after a preliminary suprapubic cystotomy.

Case III, Pte. C., aged 22, had a dilated double ureter entering a diverticulum of the bladder. This diverticulum when contracting to force out its contents caused regurgitation up the ureter. The symptoms and signs were interpreted with difficulty. The appendix was removed six months ago. There were no urinary symptoms at that time except slight increased frequency of urination. The appendix was found acutely inflamed and adherent to the caecum.

Since then pain over the right kidney had developed, frequency of urination had increased, and to it was added an after-dribble. Another prominent symptom was pain about McBurney's point, and there was tenderness here and in the right costo-vertebral angle. The urine was normal on four examinations, especially made for surgical purposes. Cystoscopy showed, in an otherwise normal bladder, a hole which, on filling the bladder tense with boric solution, was 1 cm. across and 3 cm. deep on measurement. This hole was located at the site of the right ureteric orifice and became much smaller as the urine in the bladder was drawn off. After filling the hole with 40 per cent. argyrol solution x-ray examination showed a pouch at the base of the bladder about 2 in. in

diameter around which coursed a dilated double ureter. Captain St. John has sketched this for me in Fig. 3.

FIG. 3.

The diverticulum was removed and the double ureter was transplanted elsewhere in the bladder. The amount of relief obtained will depend on the degree of renal pelvic distortion already produced by back pressure. There is no pain now, but he has had no violent exercise since operation about three weeks ago.

A SANATORIUM ROLL OF HONOUR.

BY

NOEL DEAN BARDSWELL, M.V.O., M.D., F.R.C.P.,
MEDICAL SUPERINTENDENT KING EDWARD VII SANATORIUM.

THE place of the sanatorium in a scheme for the administrative control of pulmonary tuberculosis has been the subject of considerable discussion recently. From communications to this JOURNAL and its contemporaries, and from reports of Insurance Committees one has learnt that among experienced observers widely different opinions are held. To the evidence which has been brought forward in favour of or opposed to the value of sanatorium treatment I offer this contribution, which represents the record of war service, so far as it has been ascertained, of patients at the King Edward VII Sanatorium. For an individual with arrested disease to undertake life under active service conditions, especially with the overseas troops, is to submit himself to an exacting test as to the permanence of the benefit he has received—in other words, as to the durability of the arrest of pulmonary tuberculosis following a course of treatment in the sanatorium.

It is well, when dealing with the careers of cases of pulmonary tuberculosis, to consider separately those in which tubercle bacilli were and were not found in the sputum. It is impossible here to summarize for the latter group the evidence upon which the diagnosis was determined. These cases have to be taken on trust. On the other hand, with the record of a positive sputum the diagnosis is beyond question.

Of the patients who, on admission to the sanatorium, had tubercle bacilli in the sputum, 61 are known to have served with the forces. They were discharged from the sanatorium during the years 1907 to 1915 inclusive. Thus, in respect of many of them, the improvement resulting from sanatorium treatment has been submitted to a test of durability represented by several years of full and active work in civil life followed by a period, averaging in these 61 cases some eighteen months, under active service conditions; 24 have served in France, in several instances after some months in Gallipoli and Egypt, their length of service varying from a minimum of nine months to over two years. Three patients went to Egypt, 3 to Salonica, 1 to a staff post in the West Indies, 2 to East Africa, 2 to Gallipoli, 4 joined the navy, 2 are serving in the Flying Corps, and the remaining 20 are either on home service or are still training in this country. The experience of this group of patients down to May, 1917, is as follows:

- 44 are in good health, and still serving with the various forces they engaged in;
- 5 have been killed in action, and
- 12 having relapsed, have been invalided out of the service.