5. Subglottic cancers are very unpromising as regards lasting cure by laryngo-fissure. They are frequently associated with impaired mobility or complete fixation of a cord.

As Regards Operation.

1. In every case, however limited the growth, the entire vocal cord should be excised from the anterior commissure up to and including the vocal process of the arytenoid.

2. The growth, with as wide a margin as possible of apparently healthy tissue all round it, should be removed in one mass; the excision should therefore go down to the lower edge of the subglottic area; above, it should pass through the healthy ventricular band; and externally it must include the perichondrium lining the thyroid ala.

3. To facilitate this the thyroid ala should be removed so that a laryngo-fissure is really a partial hemilaryngectomy.

REFERENCES.

- ¹ *Journ. of Laryng.*, xxviii, 1913, p. 184. ² StClair Thomson, *Intrinsic Cancer of the Larynx: Impaired Mobility of the Affected Cord in Diagnosis and Prognosis*, *Lancet*, 1920, ii, p. 183. ³ *The Throat and Nose*, fifth edition, London, 1899. ⁴ *Op. cit.*, p. 183. ⁵ F. Semon, *Clinical Journal*, February 26th, 1896. ⁶ *Loc. cit.* ⁷ *Die Therapie der Kehlkopf-tuberculose*, München, J. F. Lehmann; 1907, p. 55: quoted by F. Semon, *Journ. of Laryng.*, xxii, 1907, p. 449. ⁸ *Journ. of Laryng.*, xxii, 1907, p. 561. ⁹ W. Jobson Horne, *Journ. of Laryng.*, xiii, October, 1898, p. 481; xxii, November, 1907, p. 561. ¹⁰ *Intrinsic Cancer of the Larynx: Impaired Mobility of the Affected Cord in Diagnosis and Prognosis*, *Lancet*, 1920, ii, p. 183.

HAEMATURIA AS SEEN BY THE SURGEON.*

BY

ANDREW FULLERTON, C.B., C.M.G., F.R.C.S.I.,
SURGEON, ROYAL VICTORIA HOSPITAL, BELFAST, AND BELFAST
HOSPITAL FOR SICK CHILDREN.

THERE are certain general rules laid down by clinicians to enable the practitioner to make a shrewd guess as to the cause and origin of haematuria in a given case. These rules are useful, but, as I shall show, they cannot always be relied upon for accurate diagnosis.

The cystoscope, combined in many cases with radiography, is indispensable for the examination of cases of haematuria from kidney, ureter, bladder, or prostate, and the urethroscope for doubtful cases of urethral haemorrhage. Indiscriminate enthusiasm, however, must be deprecated. A cystoscope or a urethroscope is not to be used in every patient who complains of urinary symptoms. The cystoscope may prove to be a dangerous weapon in certain cases of tubercle, malignant disease, enlarged prostate, sepsis, and incipient or established uraemia. It is well to proceed as far as possible along the ordinary lines towards diagnosis. The cystoscope or urethroscope may then be used to complete the examination.

General Considerations.

When blood is intimately mixed with the urine it is probable that the source of the haemorrhage is the kidney. This rule is not absolute. All we can say with certainty is that the blood is shed in small or moderate quantity, allowing intimate mixture with the urine before clotting has had time to take place. The cystoscope in a renal case may show a red efflux, the smoky or dark colour of the voided specimen being due to the change of oxyhaemoglobin into methaemoglobin by admixture with the acid urine. The following cases exemplify the difficulties of diagnosis:

A male, aged 56, presented himself with haematuria. The specimen passed was dark in colour. The only other symptom was frequency of micturition. Cystoscopy showed a malignant ulcer on the base of the bladder.

A man, aged 74, complained of difficulty and frequency of micturition, especially at night. The stream was small and the urine dark red; no clots were present. Instead of the expected enlarged prostate the cystoscope showed renal haematuria from the left side.

A clergyman, aged 56, stated that after a chill in 1919 he passed blood intimately mixed with the urine. He passed no clots, had no pain nor any dysuria. He had intervals of freedom with clear urine; later, tiny clots began to appear. The symptoms suggested haematuria of renal origin. Cystoscopy showed a papilloma on the right lateral wall of the bladder.

I could multiply cases to show the fallacy of depending for a diagnosis upon the character of the urine alone.

The presence of frequency of micturition is strongly suggestive that the site of the haematuria is the bladder or prostate; but the second case just mentioned, in which the haemorrhage came from the left kidney, shows how little dependence can be placed on this symptom. Frequency and bleeding in an old man will at once suggest enlarged prostate. The bleeding, as in the case just mentioned, may be from the kidney, or it may be from an unsuspected tumour, as in the case of a man, aged 70, who had symptoms of enlarged prostate. About a month before I saw him he had haematuria with clots and complete retention. Operation discovered not only an enlarged prostate but a papilloma as well. The haematuria was due to the papilloma and his other symptoms to the enlarged prostate.

If frequency of micturition and haematuria are combined with pain in the glans penis, scalding, and urgency, and if, in addition, pus and mucus are present, the diagnosis of cystitis is justified, but malignant growths and calculus must be excluded by direct observation.

Pain in the lumbar region, whether or not it culminates in renal colic, suggests an affection of the renal region of that side, but our expectations were belied in the case of a man, aged 49 years, who had haematuria with left lumbar pain. The cystoscope showed blood issuing from the right ureteral orifice.

If the haematuria is initial—that is, at the beginning of micturition—it comes, probably, from the prostatic urethra, or possibly from the anterior urethra. Blood issuing from the urethra, independently of micturition, comes from a source distal to the compressor urethrae. A small quantity may lie in the urethra and form a cast of the canal, which is swept out by the next act of micturition. Haematuria with massive clotting is often of bladder origin. During the late war, however, one of the most formidable complications of gunshot wounds of the kidney was secondary haemorrhage,¹ and in some of the cases blood was poured out in such quantity that the bladder was distended by large clots difficult to evacuate. In civil injuries of the kidney produced by crushes or strains, clots may form in the bladder. Again, in tumours of the kidney large clots may be passed, as in the case of a man aged 53, who complained that he passed numerous blood clots, about the thickness of the little finger. Cystoscopy showed blood issuing from the right ureteral orifice. Operation revealed a hypernephroma of the right kidney.

The size and shape of the clots may be of assistance in diagnosis. A long cast of the ureter is sometimes passed. Its length and thickness indicate its origin. More frequently shorter lengths are passed. Casts formed in the urethra are thicker and often show constrictions corresponding to those normally present in this canal.

Microscopical examination of the urine, especially if it can be carried out in the intervals between the attacks of bleeding, may be helpful. Mention need only be made of the presence of renal casts, cells from the bladder, ureter, or kidney, portions of tumour, pus cells, crystals, micro-organisms, etc.

In the accompanying table I have grouped my cases according to the region affected; under each heading they are arranged in order of frequency. This has many disadvantages, but is convenient for my present purpose.

CASES OF HAEMATURIA.

Kidney.	Cases.
Tubercle of kidney (generally involving bladder secondarily) ...	100
Symptomless renal haematuria ...	47
Renal calculus ...	44
Pyelitis (including pyelitis and cystitis combined) ...	32
Renal tumours (including cysts) ...	21
Nephritis ...	19
Injury to kidney (excluding war injuries) ...	7
Renal colic (cause?) ...	5
Hydronephrosis ...	4
Pyonephrosis ...	4
Movable kidney ...	3
Horseshoe kidney ...	2
Oxaluria ...	2
Henoch's purpura ...	1
Accessory renal artery ...	1
Ureter.	
Ureteral calculus ...	9
Injury to ureter (excluding war injuries) ...	1

* Abstract of remarks opening a discussion on haematuria at the Ulster Medical Society, January, 1921.

Bladder.			
Cystitis	...	...	113
Tumours of bladder	...	...	72
Simple papillomata	...	...	41
Malignant growths	...	...	29
Fibromyoma	...	...	1
Rhabdomyosarcoma	...	...	1
Vesical calculus	...	...	34
Ulceration of bladder	...	...	10
Tubercle of bladder secondary to tubercle of epididymis	...	...	5
Ruptured vessels of bladder	...	...	4
<i>Bilharzia haematobia</i> infection of bladder	...	...	2
Injury to bladder (excluding war injuries)	...	...	1
Prostate.			
Enlarged prostate (including malignant disease)	...	...	50
Prostatic abscess and prostatitis	...	...	3
Urethra.			
Papillomata of urethra	...	...	2
Calculus in urethra	...	...	2
			600

AFFECTIONS OF THE KIDNEY.

Tubercle of the Kidney.

Tuberculosis of the urinary tract is very common in the North of Ireland. Nearly 10 per cent. of all cases cystoscoped by me had urinary tuberculosis, and in 75 per cent. of these haematuria was present. In the overwhelming majority the primary focus, as far as the urinary tract was concerned, was the kidney. In my experience tuberculosis of the bladder, arising secondarily to deposits in the epididymis and testicle, is comparatively rare. If the ureteral catheter is used in all cases of tuberculosis of the epididymis the surgeon will be surprised to find how often the kidney is affected. I have seen tuberculosis of the epididymis make its appearance three months after the removal of a tuberculous kidney on the same side, and I have under my care at present a patient from whom I removed a tuberculous kidney, who has tuberculosis of the epididymis on both sides. While in France I saw, with Major Santos of the Portuguese army, a case in which the right kidney and ureter, the bladder, the prostate, the seminal vesicles and the urethra, including the meatus externus, were all infected with tubercle. Primary tuberculosis of the bladder, if it occurs at all, is so rare that such a diagnosis should not be made except after the most careful examination of all parts of the urinary tract.

The character of the haematuria in most cases of tuberculosis of the urinary tract resembles that found in bad cases of cystitis. The blood comes for the most part from ulcers on the bladder wall. Severe haematuria from the kidney is not, in my experience, frequent, but in the following case the blood was probably of renal origin:

A man, aged 27, first noticed blood ten years ago; it was not accompanied by any other symptoms and lasted for a week. He remained well for five years, when blood again appeared, accompanied this time by pain in the right lumbar region. Three years later he noticed a lump about the size of a pea behind the left testicle. Two years ago irritability of the bladder made its appearance. In January, 1920, I removed a tuberculous right kidney. The left epididymis was at this time hard and nodular, and the vas thickened. Both epididymides are now affected and there is a discharging sinus on both sides. This case has already been referred to.

Symptomless Renal Haematuria.

I have seen 47 cases of renal haematuria in which it was the only symptom of disease except for some renal colic in a few, due, no doubt, to the passage of small clots down the ureter. Some of these cases of symptomless renal haematuria have already perhaps proved, or may in the future declare themselves to be tumours, stones, tubercle, or other demonstrable affection of the kidney, but many will doubtless remain under the heading of what is known as renal epistaxis, renal haemophilia, essential renal haematuria, or symptomless renal haematuria. The haemorrhage in these cases is more or less severe, more or less persistent, and is seen to issue from one ureter. There are intervals of freedom in which the urine shows no departure from the normal. The patient may be otherwise in fair or even good condition, and the haematuria may persist for years without any serious impairment of the health. The bleeding is unilateral. No gross changes in the kidney can be found to account for it. Various hypotheses have been advanced to explain its occurrence. It

has been attributed to passive congestion, circumscribed or diffuse fibrous changes, disturbances of the vasomotor and sensory nerves, multiple microscopic calculi of the papillae, chronic papillitis, a varicose condition of the vessels of the papillae, adhesions, microbic infections, nephritis, etc. The following case will exemplify the difficulties of diagnosis:

A gentleman, aged 42, noticed, about ten days before I saw him, that his urine was bloodstained. There was no pain, except, perhaps, a slight uneasiness in the left side. The urine was dark in colour, and there were no clots, no pus, and no sugar. Both kidneys were easily palpable. Blood was seen to issue from the left ureter. The specimen obtained from the right side was normal in all respects. Shortly after this tubercle bacilli were found in the sputum, and the patient was sent to a sanatorium for some months. He remained free from bleeding for some years. In the summer of 1919 haematuria again appeared, and he passed occasional small clots. No enlargement of either kidney was found. The urine was free from tubercle bacilli, and casts were absent. X-ray examination was negative. The bleeding stopped, and he remained clear for nearly a year. It recurred in July, 1920, and continued till October. I then injected 10 c.cm. of 5 per cent. solution of nitrate of silver into the pelvis of the affected kidney, some of which immediately escaped into the bladder. The bleeding increased for a few days and then ceased. He remained well for a month, when another recurrence took place. The complication of tubercle bacilli in the sputum raised suspicions of tuberculosis of the kidney, but no sign of this has developed during the seven years I have had him under observation.

The following case is one of the most interesting I have seen:

A sailor, aged 30, two months after a fall on his right side on board ship, noticed that his urine was smoky. Professor Rovsing of Copenhagen found blood issuing from the right ureter. X-ray examination was negative. The right kidney was explored and nothing but adhesions to surrounding parts was found. The bleeding continued for three weeks and then cleared up for a few days to recur again for a week. Again it cleared up for three or four weeks and once again it recurred. On my examination the blood was seen to come from the left side. The specimen obtained from the side operated on by Professor Rovsing was absolutely normal. Three years later I again cystoscoped this patient, who had been bleeding off and on since my first examination. The blood was now coming from the right side.

Renal Calculus.

In 44 cases of renal calculus, out of 61 examined, the presence of blood was noted. The two cardinal signs of renal calculus are renal colic and haematuria, one or other or both of which may be entirely absent. Vomiting is also frequently present. In these days radiography will detect the smallest calculus, but in my earlier work, especially in the country, I had to depend on other methods for diagnosis. A history of renal colic with or without blood, the presence of pus, the presence of albumin, and a unilateral diuresis with a diminution of the specific gravity of the urine on the affected side afforded strong presumptive evidence upon which I often operated for stone. I should now be loath to operate without an x-ray examination. The symptoms of renal calculus are sometimes closely simulated by tuberculosis of the kidney, new growths, hydronephrosis, pyonephrosis, the presence of an accessory renal artery, hydatid cysts, and what I can only describe as ureteral spasm. I have often caused typical renal colic of a temporary character by the use of the ureteral catheter, and I have at least on one occasion relieved a patient by the mere passage of the same.

Pyelitis.

The essential feature of pyelitis is the presence of pus in the urine on one or both sides. The most usual cause is the *Bacillus coli communis*, but I have seen staphylococci, streptococci, and other organisms. Though severe haemorrhage may occur, the amount of blood present in my cases has been, as a rule, small, and not a dominant feature in the clinical picture. In acute cases the temperature is raised, and it is unwise to carry out any instrumental examination. After such an examination the temperature is likely to shoot up, and rigors may occur. Every case of pyelitis should be x-rayed. I have seen a patient treated by vaccines for months for persistent pyuria due to a stone in the pelvis of the kidney.

Renal Tumours and Cysts.

Under this heading there were 21 cases, including the following: Hypernephroma, by far the most numerous; malignant adenoma, sarcoma, malignant growths of the

abdomen involving the kidney by continuity, a case of hydatid cyst which I saw in France, congenital cystic kidney, a rare form of cystic kidney removed from a child aged 2 years, and one or two cases judged to be inoperable. In the space at my disposal I can only deal in a general way with this group. In the case of hydatid cysts and the cystic kidney removed from the child aged 2 years, the bleeding, though noticeable, was neither persistent nor serious. In a case of congenital cystic kidney the bleeding was so profuse as to threaten the life of the patient; as is well known, this type of tumour is nearly always bilateral, and it is therefore useless to remove one kidney.

In a case of sarcoma of the kidney the patient, a female child aged 3 years and 3 months, had severe haematuria, and screamed with pain on passing water, no doubt owing to the clots present in the bladder. Cystoscopy confirmed the diagnosis of haemorrhage from a tumour of the left kidney. A few days later I removed a sarcomatous kidney by the trans-peritoneal route. The patient died four months later from recurrence.

A man, aged 53, gave a history of having passed a stone after "terrific" renal colic. Twelve years later he presented himself with an indistinct swelling in the side previously affected with renal colic. In the previous illness he had had haematuria of slight degree. The urine was free from blood when I saw him for the swelling in the loin. I expected to find a stone in the pelvis of the kidney from the history, and also from the cystoscopic examination, which showed a diminished specific gravity in the specimen from the affected side. Operation revealed a malignant adenoma of the kidney.

In several of the cases of hypernephroma the bleeding was considerable and clots were passed. Some of them suffered from renal colic, and others had no other symptom but painless haematuria, at any rate in the early stages.

In cases of tumour of the kidney the earliest symptom may be a type of painless haematuria exactly similar to that described as "essential renal haematuria." I am not sure that every case of renal haematuria of doubtful origin should not be explored to avoid missing an early case of malignant disease. Many unnecessary operations would doubtless be performed, but some cases of tumour would be diagnosed in time to admit of successful removal with less chance of recurrence. The appearance of a tumour in the side shows that the disease is in an advanced stage. Radiography and pyelography may show earlier some alteration in the size or contour of the kidney, or in the pelvic shadow, and ought always to be resorted to in a doubtful case.

Nephritis.

I have examined 19 of these cases suffering from haematuria. In all, some other sign or symptom was present, such as casts in the urine, albumin when the bleeding was for the moment absent, cardio-vascular changes, albuminuric retinitis, oedema of the face and extremities, or some other indication of acute or chronic nephritis. These cases belong to the domain of the physician rather than that of the surgeon. Their chief feature, from a cystoscopic point of view, is the presence of blood on both sides. In 11 of my series this was the case. One of them was a case of trench nephritis, in another with severe renal colic and unilateral haematuria the late Dr. McQuitty made the diagnosis from the discovery of albuminuric retinitis. Some of these cases have cleared up completely.

Injury to the Kidney.

Besides the 56 cases of gunshot wounds of the kidney, fully reported elsewhere,¹ I have seen in civil practice 7 cases sufficiently mild to admit of cystoscopic examination. A comparatively slight strain is sometimes sufficient to injure the kidney and give rise to considerable haematuria. I have seen this occur in a patient who slipped on a plank and apparently bruised his kidney in the effort to right himself. With more severe injuries the presence of a perirenal haematoma, as in gunshot wounds of the kidney, is an outstanding feature and a help in diagnosis.

A young man, aged 18, was seen with Dr. Mann, of Dunganon. He fell across a drain, his shoulders resting on one bank and his feet on the other, so as to produce lateral flexion of the body, with the concavity to the right side. That the kidney on this side was injured was evident from haematuria with clots, a perirenal haematoma and pain. Cystoscopy showed blood issuing from the right ureteral orifice. Recovery without operation took place. In this case the kidney was probably crushed between the ribs and the ilium on the concave side.

It is important to know when to intervene in cases of renal injury. It is almost certainly fatal to operate on a blanched patient. Blood transfusion, followed by immediate operation, saved lives during the late war.

Renal Colic without Obvious Cause.

In the 5 cases of this nature that I have seen the colic strongly suggested stone, but radiography failed to show any abnormal shadow. It may be, as Casper suggests, that spasm of the ureter occurs comparable to that of the oesophagus in hysterical people. In such cases the passage of the ureteral catheter might be tried, as in the case already mentioned.

Hydronephrosis.

Haematuria is not a cardinal sign of hydronephrosis, though it may be present. The chief signs and symptoms of this condition are pain, sometimes developing into renal colic with vomiting, and a tumour in the lumbar region which varies in size or even disappears altogether at times. The urine obtained from the affected side is of low specific gravity compared with that of the sound side. At times no fluid can be obtained owing to the block causing the hydronephrosis. In one case inspissated blood was seen by the cystoscope to be squeezed out from the ureter of the affected side like ointment from a tube. Bleeding had evidently taken place at some time into the sac of the distended kidney. By injecting opaque solutions like thorium nitrate or collargol into the pelvis of the kidney, and taking an x-ray photograph, the shape and the size of the pelvis of the kidney and its branches may be determined. If the cavity is large the opaque fluid may be so diluted that no definite shadow is seen.

Pyonephrosis.

The allied condition of pyonephrosis, of which I have had 4 cases giving a history of haematuria, is often diagnosed by the profuse discharge of pus which takes place at intervals from the distended kidney into the bladder.

In a case seen recently the urine had been clear and pronounced normal by our pathological department at the Royal Victoria Hospital. On cystoscopic examination I could detect no change in the ureter of the affected side, but on passing a ureteral catheter some way up clouds of pus were discharged by the side of the catheter into the bladder. The patient had suffered from severe attacks of renal colic. In the calyces of the distended kidney on removal a mixture of inspissated pus and blood was seen, and the colic may have been due to portions of this being passed along the ureter from time to time.

Movable Kidney.

It is well known that during Dietl's crises haematuria may occur, but I have only had 3 cases of movable kidney with haematuria sent to me for cystoscopic examination. In the first case, although the kidney was movable, pain was slight or absent. The specific gravity of the urine on the affected side was 1015, as against 1020 on the sound side. Blood was present in the jets from the affected side. Nephropexy cured the haematuria. In the second case the specific gravity was again lower on the affected side. The patient suffered from Dietl's crises. The late Dr. Hicks found the kidney surrounded by peritoneum which formed a mesentery for it. In the third case crises were present and there was considerable haematuria.

Horseshoe Kidney.

In 2 cases an exploration showed a horseshoe kidney. In the first there was a connecting band across the middle line between the lower poles of the kidneys. In the second case, which was under the care of Mr. Mitchell, I have no further note than that a horseshoe kidney was found. The symptoms in these cases resembled those of movable kidney, and were due, no doubt, to malposition of the organ with kinking of ureter or vessels.

Oxaluria.

Haematuria due to oxaluria is usually dealt with by the physician, but I have cystoscoped 2 cases in which the symptoms were attributed to the presence of numerous crystals of calcium oxalate in the urine. In one of these severe renal colic was complained of, but no stone was found on operation.

Henoch's Purpura.

I have cystoscoped one case of this affection. In addition to haematuria there were ecchymotic spots on the body, arms and legs, particularly about the joints. Haematemesis was present and moderate pyrexia. On cystoscopy blood-stained fluid was seen issuing from both ureters. The urine contained blood casts and granular casts.

Accessory Renal Artery.

I have published two cases of hydronephrosis due to this condition.³ In these no blood was found in the urine. I have, however, seen one other case in which haematuria was present, due, apparently, to the presence of an abnormal artery passing across the ureter to the lower pole of the kidney, "bow-stringing" the ureter, as Mr. Fenwick says, near its junction with the pelvis of the kidney.

AFFECTIONS OF THE URETER.

Ureteral Calculus.

In nine cases haematuria was due to ureteral calculus, which at the time of examination was arrested or actually impacted in the ureter. The symptoms resemble those of renal or vesical calculi, and are diagnosed by x ray with the opaque ureteral catheter in position. Stereoscopic radiograms should be taken, as shadows crossed by that of the opaque catheter may be in a different plane and altogether outside the region of the ureter. I adopt the method I suggested in France for locating foreign bodies in the neighbourhood of the kidney and ureter.⁴

Injury to Ureter.

In civil practice I have seen one case of injury to the ureter; it was caused by a fracture of the pelvis. I have published details of four cases seen during the war and caused by gunshot wounds. The haematuria is not, as a rule, serious. The most important diagnostic sign is urinary fistula in gunshot wounds and extravasation in the line of the ureter in civil wounds. I have used collargol injections with x ray to localize the lesions and assist in the diagnosis of these cases. The method has already been published in detail.¹

AFFECTIONS OF THE BLADDER.

Cystitis.

Haematuria was found in 113 cases of cystitis. In all it was moderate, and was often only discovered on microscopical examination. When visible it was generally of the terminal type, occurring at the end of micturition in the form of a few drops of blood with the last drops of urine. In some cases, and especially in those known as haemorrhagic cystitis, blood was mixed with the main part of the urine, although more pronounced in the last portion. During the war we became familiar with the haemorrhagic type of cystitis, with ecchymoses scattered over the mucous membrane.¹ In several of these cases streptococci were found. In ordinary circumstances, however, the most frequent organism was the *Bacillus coli communis*. Less frequent were staphylococci, *B. proteus*, gonococci, etc. In many cases, however, no bacteriological examination was made. I am not able to state definitely that in all of these cases the kidneys were free from infection. Cystitis is often due to a descending infection from the kidney. I have investigated a number of cases of cystitis which did not clear up with the ordinary methods of treatment, and in 17 pyelitis was present. These are included under the heading of pyelitis.

Tumours of the Bladder.

Some of the most severe cases of haematuria met with were due to tumours of the bladder. I have notes of 72 cases, and in most of them the haemorrhage is described as severe and associated with the formation of massive clots in the bladder. In some cases, however, the haemorrhage was trifling—at any rate, in the earlier stages.

A man, aged 38, complained of frequency of micturition and pain at the point of the penis. A little blood was passed on straining, and occasionally the act of micturition was suddenly arrested. These symptoms were strongly suggestive of stone. On passing the cystoscope, a pint of residual urine was drawn off. A small papilloma was seen to hang down over the vesical orifice of the urethra, suspended by a long pedicle. This acted as a ball valve, obstructing the flow of urine, and explained the patient's symptoms. The tumour was removed by suprapubic cystotomy.

A man, aged 54, noticed blood in his urine and slight pain in the left groin. He had some frequency of micturition during the day, but was not disturbed at night. There was also some pain at the point of the penis. The urine contained blood, but no pus. The cystoscope showed two small papillomata on the base of the bladder. These were removed by the high frequency current.

In other cases the bleeding was much more profuse, with much clotting, and in many there were multiple papillomata, extending all over the bladder. In the malignant cases sloughing of the free surface of the tumour and cystitis are more apt to occur, and the symptoms are correspondingly more severe.

The following case is so remarkable that I cannot refrain from mentioning it:

A woman, aged 51, had had the left breast removed for cancer about a year and a half before the present illness. She complained of blood in the urine; it was intimately mixed with the urine. There was a little frequency but no pain in the bladder region. There was some pain in the back, extending down the left leg. Cystoscopy showed at the apex of the bladder a sharply circumscribed circular ulcer about the size of a sixpenny-piece. The adjoining walls were drawn in folds towards the ulcerated area. Mr. Kirk operated and found an ulcer corresponding to the cystoscopic picture. The peritoneal aspect of the bladder was involved for an area rather smaller than the mucous membrane. Microscopically the ulcer proved to be scirrhus. In this case it is probable that cancer cells had dropped from the falciform ligament of the liver and taken root on the peritoneal aspect of the bladder.

The following case of fibromyoma is interesting owing to its extreme rarity:

A woman, aged 43, suffered from frequency with pain during micturition and haematuria with occasional clots. On cystoscopic examination I found a rounded projection on the right side about the size of a Tangerine orange; it was covered with normal mucous membrane, except at the inner edge where what looked like minute papillomata, or possibly mucous cysts, could be seen. I took the view that some growth in the pelvis was pushing the bladder wall inward, and referred the patient to a gynaecologist. Dr. Lowry found fibroids of the uterus, and a fibromyoma in the wall of the bladder quite free from the uterus.

The case of rhabdomyosarcoma is also interesting because very uncommon:

The patient had symptoms of cystitis for about a year. Cystoscopic examination showed on the base of the bladder, between the ureteral orifices, an ulcerated area covered with a whitish thick shreddy slough. The bladder was opened by the transvaginal route and a hardish ulcer, about half an inch in diameter, was excised. The excised area included the mouths of both ureters. Professor Symmers pronounced the ulcer to be malignant, a rhabdomyosarcoma showing muscle fibres with striation (foetal type). Also some cells round vessels (perithelioma). I examined the patient a year and a half later; the ureteric orifices were wide open, and the growth had not recurred.

Vesical Calculus.

Out of 46 cases of vesical calculus examined the presence of blood is mentioned in 34. This varied from a microscopical to a moderate degree of haemorrhage. The bleeding generally occurred at the end of micturition. The signs of stone in the bladder are sometimes obscure and the calculus is occasionally only accidentally discovered. Cases of severe cystitis are often labelled stone, and the symptoms are very similar. As a matter of fact, the symptoms of stone are due in a large measure to the cystitis which generally accompanies it. Sudden cessation of the stream is not diagnostic of stone. In cystitis spasm may occur at the neck of the bladder and the stream may be arrested, and in certain cases of stone this symptom may be entirely absent. Pain at the point of the penis is not confined to stone. It is present in cystitis. X-ray examination will detect a calculus, but I have seen a shadow in the pelvis diagnosed as stone which proved to be extravescical, and probably due to a deposit of tubercle in the ovary or broad ligament. Sir Almroth Wright asked me to see this case in France. The radiographer of the Harvard Unit had diagnosed a stone in the bladder. I could not find it on cystoscopic examination, but bimanually I could feel a hard mass in the pelvis. I subsequently removed a tuberculous kidney in this patient. The sound will detect most cases of stone, but the only satisfactory method is cystoscopy.

Ulceration of the Bladder.

Ulceration of the bladder is seen most frequently in tubercle of that organ and in malignant disease. Superficial ulceration is sometimes seen in cystitis. I have had

one case of extensive ulceration in which the mucous membrane of about a sixth part of the bladder sloughed, leaving the muscular coat exposed. This was attributed to mercury perchloride solution used to wash out the bladder, but it may have been due to an infection. Unfortunately a bacteriological examination was not made. The haematuria in the ten cases of ulceration of the bladder not due to tubercle or malignant disease, mentioned in the notes, was of a moderate character.

Rupture of Bladder Vessels.

The vessels of the mucous membrane of the healthy bladder very rarely rupture. In a few cases severe straining appears to be capable of causing this accident. I have had four cases in which such rupture had apparently taken place. One of these occurred in a case of retroverted uterus.

Bilharzia haematobia.

I have only cystoscoped two cases of bilharziasis of the bladder; both occurred in soldiers lately returned from the South African war. In the first case the symptoms came on nine months after the patient reached South Africa; he noticed a little blood at the end of micturition, but he had no other urinary symptoms. The urine was examined by Professor Symmers, who found the characteristic ova. The following appearances were seen with the cystoscope: The mucous membrane in places was dull red, thick and raised. Scattered over it were small raised white nodules, varying in size from that of a pin's head to that of a hemp seed. The little white bodies resembled pustular acne spots on the face. Small breaches of surface and haemorrhagic patches in the neighbourhood of these nodules were seen in some places. The appearances in the second case were somewhat similar.

Injury to the Bladder.

Injuries of the bladder are not infrequent in cases of fractured pelvis in civil life, but I have only cystoscoped one such case:

The patient was a railway porter who had been caught between a railway carriage and the platform. On admission to hospital he passed blood. The abdomen had been explored for ruptured bladder. There was some subperitoneal extravasation of blood on the left side of the bladder, but the peritoneum was not torn. Portions of the bowel and omentum were ecchymosed. The patient was cystoscoped a fortnight after his injury. There were a good many clots in the bladder. Several dark-coloured rents were seen in the left wall. The mucous membrane at the edges of these rents was pale, almost dead white. The rents gaped slightly. While I was examining the patient a gush of haemorrhage took place and obscured the view. This may have been from the right kidney, as I understand that Mr. Kirk later removed a ruptured right kidney.

AFFECTIONS OF THE PROSTATE AND URETHRA.

Enlarged Prostate: Prostatitis.

In some cases of enlarged prostate the haematuria is due to associated cystitis. The haematuria in these is similar to that described under the heading "cystitis." More important from the point of view of treatment is haemorrhage from the vessels of the prostate itself, or of the mucous membrane covering its projection into the bladder. This may be so severe as to fill the bladder with clots, which block the internal meatus and the eye of the catheter used for the relief of retention. The practitioner is in a difficulty when confronted with such a case. A specially constructed catheter, which can be opened at the tip, when the latter has entered the bladder and been pushed up to a region free of the clots, may be used, or it may be necessary to perform cystotomy, or even to remove the prostate as an emergency operation if the patient's condition is otherwise favourable.

The haemorrhage in the cases of prostatic abscess was not of great significance. In the prostatitis case the blood was seen in the seminal fluid after emission.

Papillomata of the Urethra.

I have notes of two cases of severe bleeding from papillomata of the urethra. In the first the bleeding was profuse and independent of micturition. Its source was detected by the urethroscope after the injection of adrenaline. Three or four small papillomata, each about

the size of a corker pin's head, were seen 2½ in. from the external meatus at a somewhat narrowed part of the urethra. Just behind this a large calibre stricture was seen. The papillomata were removed by a sharp curette, and the raw area was touched with a strong solution of nitrate of silver. The bladder, curiously enough, was full of blood, which had apparently passed back through a relaxed sphincter. On washing out, the bladder and ureteral orifices were seen to be healthy. The second case was almost exactly similar. The papillomata were removed by urethral forceps and the canal was packed for a few hours with strips of gauze.

Stone Impacted in the Urethra.

There were two cases of impacted stone in the present series. In the first the stone was situated just inside the meatus externus, and was easily removed. In the second the stone was detected in the prostatic urethra by the urethroscope. It was pushed back into the bladder and removed by litholapaxy. The bleeding in both these cases was trifling.

TREATMENT.

In cases of any severity the patient should be kept at rest, and morphine, if not contraindicated, should be administered. Calcium chloride or lactate should be given for a few days. Preparations of ergot and hazeline may be tried, and sterilized horse serum, or inhalations of CO₂, as recommended by Wright, may be of use in some cases. The underlying cause, if discoverable, will, of course, require attention. Tumours, calculi, tuberculous kidney, etc., demand surgical treatment in suitable cases. The bleeding in cystitis itself will be dealt with by urinary antiseptics and lavage of the bladder. Renal haematuria of the type known as "essential" may tax the resources of the surgeon to the utmost. Section of the kidney, decapsulation, fixation of a movable kidney, incision into the pelvis, with direct attack on the papillae, etc., and injection of silver nitrate solution or adrenaline, are among the methods used. Removal of the offending organ is a radical procedure, only justifiable if all other methods fail and the patient's life is in danger. To control haemorrhage of bladder origin, pending more radical measures, adrenaline may be employed. A slower but more lasting remedy is to irrigate with silver nitrate solution. Failing this, the bladder may have to be opened and the cause dealt with, or, if that is not feasible, a large tube may be inserted and irrigation with hot water carried out. In certain cases of haemorrhage into the bladder, with massive clotting, an evacuating catheter similar to that used for litholapaxy may be used to remove the clots. It may even be necessary to perform cystotomy to clear out the clots. Packing the bladder is an unsatisfactory proceeding. If resorted to, a way of escape must be provided for the urine, and the ureteral orifices must not be blocked. Raising the foot of the bed is helpful in some cases. Bleeding from the anterior urethra can be arrested by pressure. Bleeding from the bulbous or membranous urethra may be controlled by pressure applied to the perineum.

Finally, no patient ought to be allowed to die of haemorrhage without an attempt being made to restore him by transfusion of blood or intravenous injection of gum saline solution.

REFERENCES.

¹ *British Journal of Surgery*, vol. v, No. 18, 1917. ² *Ibid.*, vol. vi, No. 21, 1918. ³ *Ibid.*, vol. i, No. 2, 1913. ⁴ *Ibid.*, vol. iv, No. 14, 1916.

THE Union of International Associations of Brain Workers will hold a congress at Brussels from August 20th to August 22nd. The union was established in 1910. Before the war 230 associations of various kinds had joined it; of these 100 remained faithful, and took part in a congress held last year. Among the subjects to be discussed next August will be the steps which should be taken by brain workers to assert their rights in relation to both capital and labour, the difficulties encountered in the dissemination of periodical literature, and the steps which the League of Nations can take to carry out its avowed intention of helping brain workers. The subscription to the congress is 20 francs, and full particulars can be obtained on application to the Secrétariat du Congrès International du Travail Intellectuel, Palais Mondial, Parc du Cinquantenaire, Bruxelles.