13 oz.; that passed per vaginam could not be satisfactorily collected for testing purposes, but the bladder urine was normal. On December 22nd a fresh examination was made under anaesthesia to endeavour to determine from which ureter the leakage was occurring; it was found that the raw area at the vaginal vault was much smaller, though not yet healed, but it was not possible to determine from which side the urine escaped. A Luys urinary separator was then passed, and urine was obtained from the left side of the bladder only, but in very small quantity, and this in spite of the fact that the patient had been given about a pint of water to drink an hour before the observation, which was therefore not considered conclusive that it was the right ureter which had been injured. As the patient was anxious to go out, she was sent home for a time until the vaginal wound should be quite healed.

She was readmitted to the hospital on February 10th, 1906, and on the 12th an examination showed that the vaginal wound was now reduced to a small sinus from which urine flowed almost continuously; a probe could be passed along this sinus for about an inch, but it could not be made to enter either ureter. A Luys separator was again passed, and as before urine flowed from the left side only, but, as before also, in very small quantity. It now seemed quite certain that it was the right ureter which had been damaged, and it was decided to attempt to transplant it into a new spot in the bladder wall.

Operation for Transplantation of Ureter.

On February 15th, the patient being in the Trendelenburg position, the abdomen was opened by a median incision, and the intestines packed out of the pelvis by sponges, the right ureter was found without difficulty, after incising the peritoneum immediately below the pelvic brim. In order to ensure that the right ureter was the affected one, a small incision was made into it, and a probe passed downwards could not be made to enter the bladder, nor would it go into the vagina; it was thought that the latter fact was due to the tortuous course of the sinus, and the operation was proceeded with after the small lateral opening in the ureter had been closed by a couple of fine silk stitches. The duct was now isolated for a distance of about 3 in., a silk ligature was tied round it as low down as it was found possible to free it; on the kidney side a piece of fine drainage tube was tied round it to prevent leakage when it should be cut across, it was then divided just above the silk ligature.

A sound had previously been passed into the bladder, and manipulated in such a way as to determine if the length of the ureter which remained would be sufficient to enable one to fix it into the bladder without undue tension. Two silk sutures were now fixed, one on either side of the orifice of the divided ureter, to which they were tied, their ends being left long. A spot was chosen by manipulation of the sound in the bladder, as near as possible to the cut end of the ureter, and at this spot a small oblique incision was made into the viscus, through which opening the end of a pair of long fine-bladed forceps, which had been passed into the bladder above the urethra, was made to protrude; the ends of the sutures which were attached to the ureter were grasped in these forceps, and drawn out by them through the urethra; traction on the sutures caused the end of the ureter to pass into the bladder, about a quarter of an inch being thus drawn through the opening in the bladder wall. Sutures in two rows were then passed Lembert-wise, fixing the ureter into the bladder; one or two stitches were also placed in such a manner as to fix the bladder to the adjacent part of the broad ligament, and so prevent its muscular wall when contracting from causing too great tension on the sutures between it and the ureter. The piece of rubber tubing was now removed from the ureter, which was then covered in by stitching the cut edges of the peritoneum over it. Unfortunately some enlarged glands were felt in the pelvic wall which it was not possible to remove, though there could be little doubt that they were malignant. The abdomen was closed in the usual manner. The two silks which were attached to the cut end of the ureter were fixed by a stitch to the inner side of the thigh, in this way assisting to relieve the tension on the sutures fixing the bladder to the ureter.

After-history.

The subsequent progress of the case was at first satisfactory, the urine was drawn off for the first day or two at short intervals, and none came from the vagina, the patient suffered a good deal of pain, but this was relieved by morphine and belladonna suppositories. On the eighth, ninth, and tenth days, however, she had a rigor, and the temperature on each occasion rose to almost 103°; on the tenth day a little traction on the silks which still lay in the urethra brought them away, they were found, although the urine was acid, to be encrusted with phosphatic deposit. There was only a slight rise of temperature the next day, after which it fell permanently to normal. A considerable amount of pain still continued, especially during the act of micturition, which occurred unduly frequently. As it was thought that the trouble might be due to some of the sutures coming through into the bladder, and so causing trouble (as I have seen in other cases in which the bladder has been sutured), on March 22nd the urethra was dilated and a digital examination made. The interior of the bladder felt in every respect normal, and the spot where the ureter had been implanted could not be identified. Subse-

quent to this examination the pain gradually improved, and when seen on April 20th the patient expressed herself as being perfectly well.

The procedure followed in this case is much facilitated by the fact that, as the ureter receives its blood supply almost entirely from the renal and spermatic or ovarian arteries, and its vessels run down in the muscular wall of the duct, there is little danger of sloughing occurring even when a considerable length of it is isolated from the subperitoneal bed in which it lies.

Should it be found impossible to obtain a sufficient length of ureter to reach the bladder, the same method might have been adopted for transplanting the duct into the rectum, as was proposed in my case if necessity had arisen. The wisdom of leaving the silk sutures attached to the ureter and hanging out of the urethra after the operation, when they might easily have been removed by dilating the urethra may perhaps be questioned, and it seems not improbable that the rigors and rise of temperature at the commencement of the second week after the operation were due to the contamination occurring along these sutures; on the other hand, there was no doubt at the time of the operation that they very materially assisted in preventing dragging on the sutures between the bladder and ureter.

REFERENCE.

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TRAUMATIC RECTO-VESICAL FISTULA.

By H. TEMPLE MURSELL, M.B., M.C., F.R.C.S.E.,
ASSISTANT SURGEON, JOHANNESBURG HOSPITAL.

RECTO-VESICAL fistula of inflammatory, neoplastic or specific-infective origin is comparatively common, but the recorded traumatic cases are relatively rare. The following case may therefore be of some interest:

Condition on Admission.

A Kaffir "boy," aged about 30, was admitted to hospital with the history that two months before he had sat upon a spike. This was his own statement, and was not corroborated in any way by any witness of the occurrence. He had great pain and difficulty in micturition, the urine being extremely foul and full of muco-pus. More than half his urine was passed per rectum.

He was anaesthetized, and a cystoscopic examination made. The trigone was covered with muco-pus, and at one point a large trembling slough covered with phosphates could be seen occluding the opening into the rectum. The condition of the bladder generally, and of the trigone particularly, was one of acute cystitis. The local and general condition negatived any immediate operation. The bladder was washed out daily for a few days, the patient carefully fed, with a view to improving his miserable general condition, and urotropin, 5 gr., given thrice daily.

Operation.

He was again anaesthetized, the sphincter dilated, and a probe passed through the rectal opening into the bladder. This opening was situated at a point 4 in. from the anus in the middle line, and was apparently about $\frac{1}{4}$ in. in diameter. A steel bougie was passed by the urethra into the bladder. With the patient in an elevated lithotomy position, a horseshoe incision was made through the central point of the perineum, and careful dissection made between the urethra and rectum, till the probe could be isolated at a point well above the prostate in the middle line. The rectum was now everted through the anus, and a purse-string suture of catgut made to close the rectal mucous membrane. The muscular wall of the rectum was closed in a similar manner from the wound surface.

The bladder opening just admitted the tip of the index finger. The phosphate-covered slough previously seen with the cystoscope was removed, and proved to be the size of a small marble. A hard substance was now felt, and on introducing an artery forceps three pieces of stick covered with phosphates were removed. Owing to their being covered with a thick layer of muco-pus, they had not been detected with the cystoscope. They resembled fragments of ordinary firewood as used in England. Two of them were splintered and broken, showing that much force must have been exercised at the time of their introduction. They measured $2\frac{1}{2}$ in. by $\frac{1}{2}$ in., $1\frac{1}{2}$ in., and $1\frac{1}{2}$ in. respectively. The bladder wound was closed by a purse-string catgut stitch and the perineal wound, drained by two tubes, was closed. A soft catheter was tied into the bladder. Recovery was uninterrupted, and the patient left hospital well at the end of four weeks, passing a perfectly clear urine without pain.

The probability is that the stick was maliciously inserted by some one, though I could obtain no history of this. I

am informed that the forcing of a stick into the rectum is a not unknown form of native punishment for certain offences.

THE IMMEDIATE MICROSCOPICAL DIAGNOSIS OF TUMOURS DURING THE COURSE OF OPERATIONS.*

By C. B. LOCKWOOD, F.R.C.S.,
SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

IN June, 1904, I gave a lecture at St. Bartholomew's Hospital entitled, *The Early Microscopical Examination of Tumours*.¹ Perhaps this short title did not express my meaning as clearly as could be wished. It does not make clear that the early microscopical diagnosis is made whilst the patient is anaesthetized and ready for the operation to proceed, should that be necessary. Mr. Ernest Shaw is present to-night to demonstrate to you how easily and quickly a perfect section of a tumour can be placed under the microscope, and how certain that makes the diagnosis. A larger experience of the method has shown us how exceedingly valuable it is. Indeed, in my own surgical work it has become part of the organization of all operations in which any question of tumour diagnosis might possibly arise.

Many of the clinical rules laid down for the diagnosis of tumours are rules for the diagnosis of tumours which have grown until almost beyond the possibility of scientific surgery. By scientific I mean certain—absolutely certain. At first a cancer of the breast is a small, hard, painless, movable nodule, which no one can tell from a little fibroma, an adeno-fibroma, a little cyst, or an inflamed lobule. But left alone that little nodule soon—much sooner than is thought—spreads its cancer cells or juices far and wide into the lymphatic system.² An early microscopical examination—and no one can tell what that little tumour is without one—puts all doubt at rest. If the tumour be harmless the operation is quite trifling; but if it be malignant an efficient one can be done.

The diagnosis of tumours rests upon (a) clinical, (b) naked eye, and (c) microscopical characters. Even when based upon such solid foundations as these it may be profoundly modified by the ultimate fate of the patient. Of late several occurrences have shaken my belief in even the axioms of clinical surgery. What would any one think if he were told that an ossifying enchondroma had been removed from the front of the left thigh bone by sawing and chiselling through the bony pedicle? I venture to opine that few would think that the patient would come back in six years with a large growth of the upper third of the femur and enlarged glands in Scarpa's triangle, and for which I had to amputate at the hip-joint. Such a fact as this makes me wonder what will be the fate of a boy who had a similar ossifying enchondroma of the lower end of the thigh bone taken away by chiselling through its bony stalk, and then, after less than a year had elapsed, another from the same spot. Had nothing been known about what happened to these patients after the first operation, I myself, being, perhaps, still imbued with some of the "idols of the market and of the theatre," should have applied the term "innocent" to their tumours, and theorized that they would not grow again. Nay, some would have gone further and said that if they did grow again they would not have grown into the lymphatic glands. I suspect that in these cases the capsule is the source of the fresh growth. If this be a correct guess, its bearing upon the method of removal is obvious.

The truth seems to be that the time has come when most of us ought to pass in review and revise our notions about tumours. Should our ancient beliefs prove to be right no harm will be done; faith will be fortified. But should our beliefs prove to be wrong, then it is to be hoped that suffering humanity may ultimately benefit by their recantation.

Now, as regards the clinical diagnosis of tumours: It is difficult for a clinical and pathological sceptic to treat current beliefs with due reverence. My own faith has been shattered by many errors. A small, hard, movable nodule in the breast of a young woman has been diagnosed *secundum artem* to be a fibro-adenoma, and has proved to

be a carcinoma; and I am far from being the only one who has been deceived. A hard, solid mass in the full breast of a florid, middle-aged woman was surely a carcinoma, but was in reality chronically-inflamed breast with a cyst in its centre. A cyst in the mammary gland, when cut into, looked like a thick-walled cyst with walls of fibrous tissue. Its walls were cancer. A large adherent tumour of the breast, with retraction and ulceration of the nipple and enlargement of the axillary glands, was thought by many to be inoperable carcinoma. It was tuberculosis of the breast and easily taken away. An encapsulated tumour in the breast of a middle-aged woman ought to have been innocent, to use the current phrase, but it was cancerous.

A small indurated nodule in the epididymis was diagnosed by surgeons of great experience to be tuberculous. It was a small malignant adenoma. Five years afterwards a tumour grew in the other testicle. A similar nodule met with in the epididymis, and which was associated with hydrocele of the tunica vaginalis, proved forthwith to be inflammatory, not tuberculous. But on another occasion an inflamed testicle was punctured to find out the nature of some fluid. None was found, but a piece of tissue came away in the cannula. This was part of a malignant growth. To me this discovery was a complete surprise. The testicle was removed, and the diagnosis fully confirmed. I can adduce two other instances in which a swelling of the testicle was thought to be inflammatory, and treated as such, and ultimately found to be sarcomatous. Oddly enough, both occurred in cases in which the testicles had not undergone complete transition. In one, the left testicle had stopped just outside the external abdominal ring; and in the other both testicles were retained, the right in the abdomen and the left in the inguinal canal. The latter was the one which I removed, but some months afterwards an abdominal tumour appeared and carried off the patient. It was supposed to have originated in the right retained testicle. I could continue to give instances of erroneous clinical diagnosis of tumours, but surely enough have been mentioned to explain my own mental attitude towards the ordinary clinical diagnosis. It is, however, to be noted that all the examples that have been given are ones of recognized difficulty. Fortunately there are instances in which the clinical diagnosis is unerring; as, for example, when we find a hard nodule in the epididymis, together with similar ones in the prostate and vesiculæ seminales; and perhaps pus and tubercle bacilli in the urine. But I have been speaking of tumours in which corroborative evidence is lacking, and the tumour has to be considered alone, and upon its own merits or demerits. But how often there is no corroborative evidence!

Now as regards the naked-eye diagnosis of tumours after they have been cut into. Probably it is not wise to cut into tumours. Infective particles or juices may escape from them and bring about a further growth in the severed tissues. At all events the way in which nodules of cancer sometimes appear in the scar and in the stitch holes after a cancer has been cut into suggests that this is possible. Therefore it is better that whenever possible the suspicious tumour should be removed whole, and then cut into and examined. Inasmuch as tumours are now, I am glad to say, often examined before they have had time to grow big and dangerous, they can oftener be taken away whole with an abundant margin. And now as to the value of the naked-eye examination of the exterior of the tumour and of its cut surface. Some years ago I made an error which sank deeply into my mind. A large and rapidly-growing tumour of the testicle was cut into and then removed because it was thought to be malignant. Soon afterwards fresh growth appeared in the wound, and ulcerated in the manner characteristic of gumma. Iodide of potassium brought about a speedy cure; very likely it would have cured the original tumour. Again, a surgeon, who was a good pathologist, cut into a tumour growing in the subcutaneous tissue of the arm. To the naked eye it might have been a sarcoma or an inflammatory swelling. On the whole, it was most like a sarcoma. Excision of the tumour and even amputation of the arm were talked about, but the wound was closed pending a microscopical examination. Ultimately the tumour sloughed, and the slough was exactly like a piece of wet washleather. Obviously it, too, was a gumma.

* An address delivered to the Hampstead Division of the British Medical Association.