which you ought always to warn these people about, and which I do constantly warn them about, and the first is that the least quantity of alcohol will make them completely intoxicated. You know that the effect of alcohol is to cause flushing of the surface of the brain, and this result is brought about by even the smallest quantities of alcohol in many of these people who have had brain injury. So if there is one condition more than another which requires that a man shall be a teetotaler, it is serious injury to the brain, with perhaps prolonged insensibility, from which he has been fortunate enough to recover. The other thing against which I warn patients is violent over-exertion, and especially exposure to a hot sun. A man who has once had sunstroke is very liable to have headache and a return of his symptoms if he again exposes himself to the sun or over-exerts himself.

And the man with an injured brain is in a similar condition. The state of his cerebral circulation makes him very liable to have headache of a severe type, with giddiness, nausea, and impaired mental ability and control. And remember that these sequelae often last many years.

Now, you will naturally ask me, What is there inside the head of this man with traumatic epilepsy which has brought about this serious condition? If you could look inside the head, what would you see? Let me remind you of what I told you we saw in the case of the man who died a fortnight after his fracture of the base of his skull. I told you he had haemorrhage between the dura mater and the bone, and that he had extravasation of blood underneath the pia mater and tearing of the temporo-sphenoidal lobe. Well, either of these conditions may result in some permanent irritation of the cortex of the brain, and you may be sure that the man who has developed epilepsy, and who was so long unconscious, had an extensive tear of his brain and that he had extravasation of blood in large quantities. He probably had extensive scarring of the torn tissues and a hardening and thickening of the membrane called pachymeningitis which has caused irritation of the surface convolutions resulting in the epileptiform fits. Unfortunately for the patient there is not the least evidence to help us as to where he has this trouble, for there is no localizing evidence. In some cases the evidence is clear. Sometimes the epilepsy is of the "Jacksonian" type, in which the fit begins always by a convulsion or spasm in some particular portion of the body, and spreads from thence until it becomes generalized. So that a man with Jacksonian epilepsy may have a fit commencing by spasmodic movements in the thumb which may spread to his fingers and then to the forearm, then to the arm, and so to his body. In that case he has what is called a focal lesion, for there is a point in the brain from which this trouble spreads, and the part affected in such a case as I have suggested is the cortical centre for the thumb and the hand. In that locality there may be a piece of displaced or jagged bone, or there may be a blood cyst, or some thickening of the membranes or some scarring of the brain. If there are any of these indications you may accept them as suggestions for a mode of treatment which may save the patient. You may operate at the place which is indicated by the position and character of these spasms, and you may remove a portion of the bone which may be pressing on the brain, or you may evacuate blood which has accumulated and is exerting similar pressure. I will conclude by mentioning one more case to illustrate this condition. A man had an injury to his skull and brain for which he was admitted into another hospital, and there he remained semi-conscious or unconscious for nearly three months. He recovered from this injury very slowly, and afterwards, as people say, he was never the same man as before. Instead of being cheerful and good-tempered, he was morose and unsociable, and became liable to violent fits of passion, which were purposeless and apparently causeless. These attacks continued, and were succeeded at the end of more than a year by epilepsy, and the epileptic attacks rapidly increased in frequency till he was brought to this hospital in a condition of what is called post-epileptic coma. In this condition he died. We examined him *post mortem*, and found that on one side of his brain there was a large blood cyst. There had been extravasation into the subarachnoid space of blood from either a torn brain or torn membranes,

and the blood had become encysted, and caused irritation to the cortex of his brain. I think if he could have been operated upon that man's life might have been completely altered, for it is likely that the whole of his symptoms were due to the pressure and irritation of this blood cyst.

INTRAPERITONEAL IMPLANTATION OF THE URETERS INTO THE COLON.*

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FEW conditions are more distressing than the constant escape of the whole of the urine above the pubes with practically no efficient means of control. Most of the patients who suffer from this misery are the subjects of extroversion of the bladder, and though life to some of them may be made more or less tolerable, yet the results of the various plastic operations are, on the whole, so unsatisfactory, that I am sure most surgeons dread having such cases committed to their charge.

In recent times, for the relief of extroversion, there has been a tendency to divert the urine into the large bowel as an alternative to direct plastic operations, with their disappointing results. This is the revival of a procedure first imperfectly carried out by Sir John Simon, and later, on a sounder plan, by Sir Thomas Smith. The latter surgeon formulated the extraperitoneal method of implantation of the ureters each into the colon of its own side through a lumbar incision; this in 1878. The final result of this operation, however, was discouraging, and, as far as I am aware, several years elapsed before the method was revived, and with it others on similar lines. At the present time, in addition to the extraperitoneal method of operation, we have two others—(1) intraperitoneal implantation of each ureter separately into the colon of its own side; and (2) implantation of the separated trigonal area with both ureteral orifices into either rectum or sigmoid.

Diversion of urine into the bowel may be resorted to for other conditions than extroversion of the bladder. In cancer of the bladder encroaching, as it is apt to do, on the trigonal region, excision of the growth may be feasible if provision can be made for the collection and storage of the urine after removal of the lower ends of the ureters in the resection.

In accidental division of ureters in abdominal operations, when re-implantation into the bladder is impossible, grafting into the colon is worth consideration as an alternative to nephrectomy.

Another extension may be found in unfortunate patients such as the one I exhibit to you to-day—the victim of an injury:

This young man, aged 20 years, was, five years ago, admitted to a hospital suffering from fractured pelvis with ruptured urethra and laceration of the neck of his bladder. Exit for the urine was given by suprapubic drainage, and when I saw the patient on June 4th, 1906, the whole of the urine escaped above the pubes, where there was, in addition, a suppurating sinus leading down to the back of the fractured pubic bone. A marked effect on the sexual development of the patient appears to have resulted from the injury, for though the age of puberty has been attained, the penis and testicles are quite undeveloped, as are the other sexual characters.

As no effort had hitherto been made to restore the urethra, I thought this should be attempted, but the final result was in some degree an exaggeration of the patient's miseries, for a recto-vesical fistula was formed, and the treatment was abandoned. At the time of this operation the suprapubic wound was opened up, and the densest of scar tissue was found under the pubic arch and encroaching upon the neck of the bladder.

The failure to secure patency of the urethra led me to adopt ureteral implantation for the patient's relief. The three methods which I have already mentioned were open to me. Maydl's operation, implantation of the trigonal area with both ureters into the rectum, which has much to recommend it in cases of extroversion, was here quite unsuitable owing to the dense matting of parts already referred to. For each of the remaining alternatives there were arguments. The extraperitoneal operation avoids

* A note read at the meeting of the Clinical and Pathological Section of the Birmingham Branch on October 26th, 1906.

almost entirely, though not completely, the risk of peritonitis, but I regard it as more difficult to perform, as inflicting a more severe traumatism on the patient, and as more likely to fail from want of speedy union between ureter and bowel.

With these thoughts in my mind, I determined to adopt the intraperitoneal method. One other point had to be considered: Should both ureters be implanted at one operation? Argument seemed to me to be strongly in favour of dividing the proceeding into two separate operations. The patient was a feeble subject; if both ureters were simultaneously implanted and infection spread up both sides, a successful result could hardly be hoped for, whereas, if one ureter only were implanted, should its kidney become infected, the other kidney would be carrying on excretion. When the first organ dealt with had settled down, the second operation could be performed with less anxiety.

Operation.

The method of operation was as follows: An incision was made through the sheath of the rectus over the line of the ureter, where it crosses the bifurcation of the common iliac artery; the layer of peritoneum over the artery was divided and the ureter sought. (If there is any doubt or difficulty in recognizing the ureter, useful assistance may be gained by lightly prodding the tube with forceps or dissector; if it be the ureter which is touched, a wave of peristalsis will be seen to pass along it where it is stimulated.) The ureter was found with little difficulty, and was lifted out of its bed for about an inch and a half, was divided low down, the lower end ligatured and pushed under the peritoneum, whilst the upper end was held lightly between finger and thumb to prevent leaking. The portion of bowel to be used was selected, and a puncture barely one-third of an inch long made on its inner side, the utmost care being observed to prevent any faecal soiling. The upper end of the ureter was threaded with a fine catgut suture, the needle attached to which was passed into the opening in the colon, across the bowel and through its opposite wall. By means of this suture the ureter was drawn inside the bowel, and held in position whilst a first row of interrupted sutures fixed the outer coats of the ureter to the margins of the incision in the intestine, and narrowed this opening up to the walls of the ureter, but without constriction. A second row of sutures approximated the peritoneal covering of the bowel to the outer coat of the ureter, and so secured rapid adhesion and seclusion. The suture through the wall of the colon to retain the ureter, whilst suturing fixed it, was now cut short and its point of exit secured by a single mattress suture. The colon was displaced somewhat towards the middle line, which relieved the ureter from tension and tended to return it to the bed of subperitoneal fat from which it had been disturbed, whilst finally the inner edge of the divided posterior peritoneum was sutured to the inner margin of the colon, thus giving further security against leaking. The wound was closed except for a small gauze drain.

The operation on the right side was rather more difficult than that on the left, as the small intestine was not so easily pushed out of the way and the common iliac vein obtruded a good deal into the wound when the posterior peritoneum was divided. On the whole, however, neither operation can be described as really difficult.

If I have occasion to again perform this operation I shall adopt a small device to prevent what is certainly a possible contingency, namely, the cicatrization of the ureteral opening. This, I believe, can best be met by slitting the opening of the ureter into two small flaps of equal size, folding the flaps backwards and suturing them in that position. If union were thus secured it would be an absolute bar to future stricture of the ureteral orifice.

To return to the patient, the first operation on the left side was performed on July 23rd, 1906, the ureter being implanted into the sigmoid, and though well borne was followed by vomiting which persisted for several days and a quick pulse which remained over 100 for ten days, but there was no local pain or tenderness suggesting infection of the left kidney, and the temperature after the first three days was normal. The second operation, on the right side, was performed on October 1st and was well borne, though again vomiting was troublesome for two days and the pulse remained quick for a week.

Since the second operation the patient has improved greatly in his general condition, and now looks fit and well. His bowels act almost every four hours when he is up, but at somewhat longer intervals when he is in bed. Above the pubes a sinus from the bladder discharges about a drachm of fluid daily. The temperature is normal; there is no complaint of pain over the kidney; neither kidney can be palpated. The patient's future is, of course, one of great uncertainty, owing to the ever-present risk of an ascending nephritis by infection from the bowel, and because of the possibility that either, or

both, ureteral orifices may become partly or completely closed by scar tissue.

Whatever his future, his present state is an enormous improvement on his past, for he not only lives in comfort now but is capable of earning his living.

The method employed for this boy's relief was suggested to my mind by two interesting papers in the *BRITISH MEDICAL JOURNAL* of April 28th, 1906.¹ The extra-peritoneal operation was adopted in the cases described in these papers, and any one contemplating the relief of extroverted bladder by ureteral implantation would do well to study the methods described in that issue of the *JOURNAL*.

REFERENCE.

¹ On Extroversion of the Bladder, with Special Reference to Extra-peritoneal Transplantation of the Ureters into the Rectum, by Alfred London, M.D. Extroversion of the Bladder: Its Treatment by Extra-peritoneal Implantation of the Ureters into the Rectum, by H. Simpson Newland, M.B., M.S.

TRANSPLANTATION OF THE URETER INTO THE BLADDER FOR URETERO-VAGINAL FISTULA.

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DAMAGE of one of the ureters in the course of an operation is always an unfortunate accident. In cases in which a ureteral fistula has resulted, a not unusual method of treatment in the past has been the removal of the kidney to which the damaged ureter belongs. There are clearly very great objections to such a procedure, and in a case such as that described below there would in addition have been a very considerable risk, owing to the fact that the opposite kidney does not seem to have been doing its work very efficiently, as indicated by the small average quantity of urine passed per diem, though it is true that no estimate of the urea was made. The mode of operating adopted was that described by Hammerschlag,¹ and which he has successfully carried out in a case in which a uretero-cervical fistula had resulted from prolonged pressure, during parturition, in a case of protracted transverse presentation.

E. S., a married woman aged 37, was admitted into the Mildmay Hospital on October 25th, 1905, suffering from carcinoma of the cervix uteri.

Vaginal Hysterectomy.

The growth was of the ulcerating variety, and had extended somewhat on to the vaginal wall; but as the broad ligaments did not appear to be involved to any appreciable extent and the uterus could be well drawn down, vaginal hysterectomy was performed on October 26th. Three pairs of forceps were placed on each broad ligament and left on. Except for the fact that, owing to some involvement of the vaginal wall, these forceps were placed rather more laterally than might have been wished, especially at the lower part of the broad ligaments, there was nothing special to note about the operation. The forceps were removed on the 28th, and, apart from some pain and a little rise of temperature, the progress of the patient was perfectly satisfactory.

After-history.

A day or two later it was noticed that some urine was being passed involuntarily, but it was thought to come from the urethra and not from the vagina. On November 6th a small slough came away per vaginam, and on November 9th a much larger slough—evidently the part of one of the broad ligaments which had been compressed by the forceps—was passed. Urine still continued to come away involuntarily, and it now was noted to come from the vagina and not from the urethra.

As the incontinence still continued, an anaesthetic was given on November 30th, and a careful examination made. The bladder was found to be perfectly watertight, but the vagina was continually wet with urine, which came from a raw surface occupying the whole of its vault; it could not be determined from which side the leakage occurred, but it was quite clear that one of the ureters had been damaged, either by being included in one of the forceps at the time of the operation, or by subsequent extension of sloughing. Owing to a large area in the vagina still remaining unhealed, it was decided to postpone the consideration of any further operation until this raw surface should be covered in.

In the early part of December the patient complained of some pain in the right loin, and it was found possible to feel the right kidney, which was a little enlarged and somewhat tender; this trouble, however, soon passed off. The amount of urine passed per vaginam continued to be very considerable, and the average amount passed per diem from the bladder was