never able to get proper surgical treatment. When he came under my care, in March last, his perineum and scrotum were riddled with sinuses, through which the urine escaped, only a few drops coming from the orifice of the urethra. He was emaciated and broken down in health, and was evidently suffering most severely. After several attempts, I passed a No. 1 elastic catheter into the bladder, and, two days afterwards, performed internal urethrotomy. In this case, I had to cut through three distinct strictured portions instead of one continuous one. A No. 10 catheter was passed and fastened in. The sinuses were laid open to such extent and in such manner as seemed desirable. No bad symptom followed; but the greatest relief was experienced. In three weeks, the patient was up and about. The sinuses had apparently almost filled up. He was not allowed, however, to pass his urine without the aid of the catheter for another fortnight or three weeks, at the end of which time the old sinuses appeared fairly closed up. The improvement in general health and condition was rapid and marked. Three months after the operation, he declared himself better and stronger than he had been for years, and altogether free from pain and trouble about his urinary organs. He continued, however, to use the catheter at least once daily.

How far the good results obtained in these, and the other cases to which I have more briefly alluded, will prove permanent, remains to be seen. But, at any rate, a large measure of immediate relief has been afforded. And I cannot help believing that the new cicatricial tissue of an incised surface may prove less likely to contract speedily than the tissues around a stricture after ordinary methods of dilatation, and to become the seat of fresh inflammatory swelling and thickening.

In conclusion, I would venture to say that, although I have spoken so far in favour of the operation of internal urethrotomy, and so hopefully as to the results to be expected from it, I should be very sorry to leave the impression that I would advocate or practise this operation indiscriminately in all cases of stricture. For ordinary cases, I believe the ordinary method safest and best. Internal urethrotomy must be regarded as an exceptional operation, to be practised in exceptional cases. But, as such, I believe it well worthy of adoption—at any rate, of more extensive trial than it has yet had in this country.

ON STRICTURE OF THE URETHRA; WITH SPECIAL REFERENCE TO URETHROTOMY.*

By EDWARD ATKINSON, M.R.C.S., F.L.S.,

Surgeon to the General Infirmary, Leeds; and Lecturer on Surgery at the Leeds School of Medicine

THE selection, by the officers of the Section, of Stricture of the Urethra, with special reference to Urethrotomy, as one of the subjects on which they invited discussion at the present meeting, must be my apology for offering the following remarks, rather than because I have much that is new either to suggest or to relate.

Perhaps their choice may owe something to the remark of my colleague Mr. Wheelhouse, in his communication to the JOURNAL last July, upon his method of performing perineal section: that, although the operation, as performed at Leeds, had been before the profession for some years, having been published by him in 1869-70, it had received but little notice either in the journals or in recent surgical works. Be that as it may, Mr. Wheelhouse's letter was followed in three months by the appearance of Mr. Teevan's most interesting and ingenious paper on an Improved Method of Performing the *Bouttonnière* Operation, in which he truly says: "In Leeds the operation is performed systematically, frequently; and I should say that, in that town, it is done more often in one year than in all the hospitals in London put together during the same period."

In support of this statement, I may say that I have performed it myself nine times in the last three years in hospital and once in private, and that each of my colleagues has done it many times within the same period. I can also assert that, of my own ten cases, eight were successful, and of most of them that they were seen several months after their discharge from hospital, when the results were found to be quite satisfactory as regards the cure of the stricture. In no case had perineal fistula resulted, and in one only had there been any untoward effect of any other description. To this case I will refer more particularly afterwards.

The two instances in which I was unsuccessful were both desperate cases. In one, extensive extravasation of urine had occurred before admission; in the other, there were large abscesses both in the scrotum and perineum, with several fistulous openings from old abscesses, and

the patient was in a very low condition generally. Both these cases died within three to six days after operation.

The total number of operations for perineal section, done in hospital during the last three years, is thirty-nine, of which seven died; this gives a mortality of nearly 18 per cent.

According to surgical authorities, both English and French, various modes of procedure for the relief of stricture by urethrotomy are recommended; some of which are deemed to be preferable in one class of cases and some in another. Distinctions are drawn between the circumstances which render this or that operation the most applicable to a given case. Thus, in old cartilaginous strictures of the membranous portion of the urethra, complicated or uncomplicated by fistulae in the perineum, one or another modification of the *bouttonnière* operation is preferred. In cases of retention, where all attempts to pass an instrument through the stricture fail, and the urethra is distended behind the constriction, Mr. Furneaux Jordan counsels the opening of the distended urethra and division of the stricture from behind forwards; while in very tight strictures, where extreme sensibility of the passage resists treatment by dilatation beyond a certain limit, or where such treatment, as soon as discontinued, is followed by a return to the *status quo ante*—and especially when the stricture of this character exists in any part of the straight portion of the canal—internal urethrotomy by Civiale's method, or some modification of it, is often advised.

It is no doubt true of these operations, as it is of many other surgical procedures, that one method proves more frequently successful in the hands of one surgeon, while another method succeeds best in the hands of his friend. This is intelligible enough; for he who has familiarised himself with the steps and the minute details of a given operation, by the habitual adoption of it in a long series of cases (in which numerous varieties of conditions are sure to occur), is more likely to be able to accommodate it to the special requirements of an exceptional case; whereas his occasional adoption of a different method, with the minutiae of which he was not so familiar, might not improbably result in disappointment.

At Leeds, it has now for some years been customary to pursue that mode of perineal section—or "*bouttonnière*", as Mr. Teevan prefers to call it—(though why we should go to the French for a name when English serves our purpose I do not exactly understand) which has been fully described by Mr. Wheelhouse; and this, not only in the class of cases referred to above, but in almost every instance where it is considered necessary for the cure of a stricture, whether literally impermeable or not, to incise it, so as to pass a full-sized catheter into the bladder.

The main features of the operation (though they are before the profession) may be briefly epitomised here.

1. The introduction of Wheelhouse's straight button-ended staff, grooved to within half an inch of its extremity, down to the strictured point, with the groove looking forwards.

2. The opening of the urethra in the groove and not upon the point of the staff, so as to secure at least a quarter of an inch of healthy urethra in front of the stricture.

3. The seizing of the cut edges of the wound in the urethra by two pairs of straight-bladed nibbed forceps, while the staff is turned round and withdrawn sufficiently to hook up the upper angle of the opened urethra. A lozenge-shaped window is thus obtained, through which the stricture can be seen, and often the orifice in it can be detected.

4. The introduction of a finely probe-pointed director into the stricture, and through it on towards the bladder. This, of course, is the *crux* of the operation. It is readily to be conceived that, in cases complicated by false passages, the danger of proceeding to cut on the director, upon the supposition of its having entered the bladder, when it has not, should haunt the mind of the operator; but, as a matter of fact, I think I am justified in quoting Mr. Wheelhouse's expression, that its entrance is "clearly demonstrated by the freedom of its movements." Though difficult cases sometimes occur, I have never seen one in which the director has failed to guide safely.

5. The groove of the director having been turned downwards, the stricture is divided on its under surface by the scalpel, and a straight probe-pointed bistoury is afterwards carried along the groove, beyond the external wound, to insure complete division of all obstruction; and then,

Lastly, a most important and essential step, in order to insure the safe conduct of the catheter into the bladder: Teale's probe-gorget is guided along the grooved director into the bladder, dilating the stricture, proving by the gush of urine which flows along it that the viscus is reached, and forming a metallic floor over which the silver catheter cannot fail to pass safely to its destination.

Of the eight cases successfully operated on by myself, three were old cartilaginous strictures, which would admit of no instrument being passed through the meatus. Two belonged to the category of tight

* Read in the Section of Surgery at the Annual Meeting of the British Medical Association in Manchester, August 1877.

strictures in highly irritable urethræ, which admitted the passage of a No. 4 and No. 6 catheter respectively, but resented further dilatation, which always set up constitutional disturbance. One case was admitted with complete retention; and hot bath, chloroform, opiate enemata, and the evacuation of the bladder by the aspirator, having failed to obtain the introduction of any instrument through the stricture, urethrotomy was resorted to. The last case in which I operated came under none of these heads. He was a man aged 46, who had suffered from spasmodic stricture for five or six years. He was a highly nervous subject and a thorough hypochondriac. Attention to his diet and general health, and the occasional passing of a catheter after a few days' rest in bed, gave only temporary relief. If I attempted to introduce an instrument when going round the wards with my class, I never succeeded; but on returning to him alone half an hour afterwards, I could pass No. 12. Thinking that, by opening the urethra in the perinæum and allowing the urine to drain away for a week or two, I should give the irritable urethra a complete rest, and so permanently relieve the spasm, I consulted my colleagues on the case; and, as they all fully concurred in my hopes of the good to be anticipated from such a course, I performed perineal section, freely dividing the membranous portion of the canal throughout its extent, and, having introduced a full sized catheter, withdrew it again, and did not reintroduce it for ten days. This case is still under treatment, but hitherto there seems to be every prospect of a favourable result. Whenever the catheter has been left in in this case, even for four or five hours, a severe urethral rigor, with sudden rise of temperature, has taken place, and that since, as well as before, the operation, sufficiently showing the sensitive condition of the part; and showing also, I think, not only the insufficiency, but the inappropriateness, of treatment in this instance by dilatation alone.

I have now only to refer to the case in which an untoward effect followed the operation, and which was not discovered until six months afterwards.

The patient was a young tradesman, aged 25, who consulted me for a tight and somewhat oblique stricture seated at the junction between the spongy and membranous portions of the canal. No metal instrument would pass, but after many trials I passed a soft *cathetère à boule*, first a No. 3, and at subsequent sittings Nos. 4 and 5. Beyond this point I made no advance; and in addition to the unyielding character of the stricture and its obliquity, the urethra was so exquisitely sensitive, that every time the instrument was used, though with the most gentle manipulation and without ever causing bleeding, the patient was in pain for twenty-four hours or more after it. I therefore resolved on dividing the stricture, and, accordingly, performed perineal section, in the manner above detailed, in September 1875. The bulb was notched, and the anterior half of the membranous portion was divided in the middle line. The stricture was cleanly divided, and the probe-gorget having been used to dilate the posterior portion, a full-sized silver catheter was carried along it into the bladder and retained for thirty hours only. After this, it was introduced every second day for a fortnight, then twice a week for a fortnight more, when he went into the country; but visited me once in a week or ten days to have the instrument passed. The perineal wound closed at the end of three weeks after operation, and he never had a bad symptom nor failed to pass his urine in a good stream. Six months afterwards, he married; and in April 1876, he came to me complaining that he had no satisfaction *in coitu*. The act was completed, but there was no ejaculatory power. The seminal discharge was emitted (or, as he expressed it, "oozed out"), without any sensation of propulsion. I imagined that this was due to recontraction of the canal, but found no difficulty in passing a bougie, and he afterwards passed urine, without assistance, in a good stream. I encouraged him to hope that he would regain the power in time, and recommended him to abstain from sexual intercourse for a while; but several months later, he returned with the same story, and more downcast than before, because there was no promise of his marriage becoming fruitful. Now, what had happened? Was it the division of the fibres of the accelerator muscle? This would have been the explanation which would probably occur to one at first. But is this muscle the real agent of ejaculation? According to Professor Küss of Strasburg it is not; or, at any rate, only in a secondary degree. That physiologist says: "At the moment that the sperm is poured into the prostatic portion, this portion of the canal is isolated from the bladder, on account of the turgescence of the *verumontanum*, which is, during erection, in contact with the anterior wall (as shown by Kobelt); and we all know that micturition is impossible during the state of erection. On the other hand, the efferent ducts of the vesiculæ seminales, incorrectly called "ejaculatory ducts" open *in front of and at each side of the verumontanum*; so that the sperm readily passes into the prostatic urethra, which it fills up, but it can go no farther, because at this moment the urethral sphincter (called Wilson's muscle)

contracts and obliterates the membranous portion. The fluid, therefore, accumulates in the straight part of the canal between these two points under high pressure. But the sphincter muscle cannot long maintain its contraction; it relaxes, and immediately the seminal fluid is ejaculated with force due to the sudden relief of the pressure, while the rhythmical character of the emission is due to alternate contraction and relaxation of Wilson's muscle; though doubtless, also, the contact of the seminal fluid with the mucous surface influences the intermittent and tetanic contraction of the urethral sphincter." (Küss.)

It appears to me, therefore, that in the case related above, the loss of ejaculatory power is more probably the result of injury to Wilson's muscle, or the nerves supplying it, either by division or distension, than to injury of the bulb or the bulbo-cavernosus muscle, generally called the ejaculator seminis. Whichever be the true explanation, it appears singular that this result should not be more frequently heard of after perineal section.

ON INTERNAL URETHROTOMY.*

By W. F. TEEVAN, B.A., F.R.C.S.,

Surgeon to the West London Hospital; Surgeon to St. Peter's Hospital; etc.

WITHIN the past few years, the operation of internal urethrotomy has occupied much attention in this country; the principles of the procedure have been more clearly established and better carried out, great improvements have been effected in the instruments used, and I think it may be safely predicted that internal urethrotomy will, in the future, attain that position to which it is justly entitled.

I would firstly remark that I consider most urethral strictures are best treated by gradual dilatation, carried out by means of soft instruments; that an operation is but seldom called for, and ought, as a rule, to be only resorted to after milder measures have failed. I would also observe that, pathologically, there is no evidence to prove that a stricture can be cured; but practically all strictures are curable, provided an instrument is occasionally passed at regular intervals for life.

Now, if an operation be indicated, what are the requirements it must fulfil? what, in fact, is demanded of it to prove successful? I do not think the answer can be found in any English work; we must ask French or American surgeons. The former would reply that the insertion of the "*pièce d'allongement*" is required; whilst the latter would say that a "cicatrical splice" is wanted. The above expressions convey, in a very clear and concise manner, what is indicated. We have to enlarge the contracted urethra by letting into it a splice of new tissue, which is of a necessity cicatrical. We know that cicatrices are endowed with varying powers of contraction; those, for instance, which result from the clean cut of a surgeon's knife shrink but little, whereas those following lacerations contract greatly. Hence, therefore, a cicatrix made by a clean incision possesses the minimum amount of contraction, whilst that following a laceration has the maximum degree; and, inasmuch as we want a cicatrix which will contract as little as possible, we must choose a cutting operation, and not a tearing one, like the so-called "immediate dilatation".

Let us not forget these two following important surgical facts, which we constantly see, and which vividly show the relative results of cutting and laceration. When a surgeon incises the healthy urethra of a man, in the operation of lithotomy, no stricture follows when the wound is healed; but if the same man had been kicked in the perinæum and his urethra torn, a stricture of the worst description would have ensued. Hence our choice is limited to cutting operations. Now, there are three forms of urethrotomy—external, subcutaneous, and internal. The external I regard as a severe procedure, which ought to be very rarely required; the subcutaneous is only adapted for cases where there is but a single stricture; whilst internal division can deal with any number of strictures; and, as it is a procedure which is attended with but little risk to life, it must be regarded as our stock operation for stricture. In what cases would I operate? If the stricture be non-dilatable, or, if dilatable, it contract again as fast as it is stretched; or if there were numerous fistulæ combined with a tough stricture; or if the process of gradual dilatation were attended with great pain or constitutional disturbance; or, lastly, if continuous dilatation had failed. It may also be premised that penile strictures and those of traumatic origin are not usually amenable to dilatation, and require to be cut. Having determined on internal urethrotomy, shall we divide the stricture from before backwards, or from behind forwards? The answer to this question has divided surgeons into opposite camps, and acrimonious discussions have taken place. As both parties have obtained good results, they have

* Read in the Section of Surgery at the Annual Meeting of the British Medical Association in Manchester, August 1877.