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Contributors

Browne, G. Buckston 1850-1945.
Tweedy, John, 1849-1924
Royal College of Surgeons of England

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The Harveian Lectures

ON

TWENTY-FIVE YEARS' EXPERIENCE

OF

URINARY SURGERY

IN ENGLAND

Delivered before the Harveian Society of London

BY

G. BUCKSTON BROWNE

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URINARY SURGERY IN ENGLAND

LECTURE I.

Delivered on November 7th, 1901.

Mr. President and Gentlemen,—In thanking the Harveian Society for the honour which it has conferred upon me in inviting me to deliver the Harveian Lectures I should like to remark upon the unusual nature of the society's choice. The Harveian Society has invited a purely private practitioner to lecture before it. My life since I left University College Hospital and School in December, 1874, where I was first of all house surgeon and then demonstrator of anatomy, has been entirely devoted to private practice. At the end of the year 1874 I was invited by Sir Henry Thompson to join him as his assistant and for the next 14 years we were side by side. He never operated without my being present and I practically saw all his patients with him. These 14 years were very active and full of experience and opportunity. When they came to an end I worked on alone, not less actively, so that I have had 27 years in one great department of surgery—namely, the surgical diseases of the urinary organs, and I propose to devote this present course of lectures to what I think I have learned in these years and to attempt to give my reasons for the faith which I believe is in me. Just as in ovariotomy and in all abdominal surgery peritonitis was in the

early days the great dread of the surgeon, so in urinary surgery fever was the great fear of the operator. And this fear controlled, influenced, and in fact dominated all his movements and all his plans and checked all his enterprise. If he passed a lithotrite or employed a catheter he often found that fever followed, and a fever which not infrequently proved fatal. The surgeon therefore interfered as little as possible with the urinary passages and for many years but little real progress was made.

I propose at once to consider the question of urinary fever, for it is at the bottom of the whole of urinary surgery. Whenever you touch urinary surgery you find this fever, and even now its causation and therefore its prevention is very little understood. In all our books you find vague and uncertain statements. I believe this fever to be at its outset purely a suppression of urine, varying from merely transitory to the most complete and absolute, this suppression being due to the inhibition of the action of the kidney from urethral shock. The nerve supply of the urethra is remarkably generous and the penis itself is most intimately connected in this way with the rest of the body. An excellent illustration of the very liberal nerve-supply of the urethra and of its intimate connexion with the rest of the body is afforded by the study of the marvellous phenomena of erection. In the pre-chloroform days many a man has died upon the operating-table simply from the shock of an amputation of the penis. If a bougie is passed upon the average young man in the standing posture he will in many cases in a few moments be writhing on the floor in what is practically an epileptiform convulsion; let him be put to bed, and a good perspiration encouraged, and he will soon be well; but if an old man be subjected to a similar shock he does not always recover. Many surgeons of sufficient experience will be able to recall some case of an elderly man who has had a catheter passed and who has never secreted another drop of urine and has died. In illustration of the effects of shock and of its control by the use of sedatives I well remember a nervous, sensitive, highly-strung young practitioner who came to me with a severe urethral stricture. The gentlest instrumentation was followed by high fever. I fortunately thought of giving him one-sixth of a grain of morphia hypodermically an hour before passing the bougie. This was followed by the happiest results: there was no fever and dilatation was easily proceeded with. Some years ago I had even a more instructive case than this with my old fellow-student Dr. Peter Duncan of Croydon. He called me to a case of an elderly

gentleman with retention of urine and a long history of urethral stricture. The case was urgent and with great care and not easily I passed a No. 1 silver catheter and drew off a large quantity of urine. Next day I found the patient comatose and so ill from urinary fever that both Dr. Duncan and I thought he would die. He responded, however, to active treatment and made a good recovery. The question then was, what was to be done to the stricture? It must be treated, but if the simple passage of a No. 1 silver catheter was nearly followed by death, what would happen if the interference was more radical than that? Sir William Broadbent supported me in my proposal to perform my operation of internal urethrotomy at one sitting under an anæsthetic. A clean cut through the fibres of the stricture was followed by the best results. There was no fever, no illness of any kind, and the patient lived for several years in perfect urethral comfort. We often find in practice that the stricture patient can bear a certain sized bougie well, but if an instrument at all larger is used its introduction is sure to be followed by fever. I have often found that a medical friend is very much surprised when it is pointed out to him that however often he has had to deal with urinary fever in male adults he has never had to do with it in women or in children of either sex, for women and children never suffer from this fever. Now do not all these facts prove that the fever is due to nervous shock, to urethral shock? The male adult's urethra is a sexual as well as a urinary tract, his penis is highly endowed with nerves, and it is precisely he who suffers from this fever. The urethra of the woman and child is a urinary tract only and they do not suffer. Deal gently with the male urethra and all will probably be well; use violence and the results may be disastrous. Narcotise the patient with opium or with chloroform and you may use violence up to a certain point and still have no fever. You may often cut the urethra, if you do not stretch it, and have no fever. You may one day pass a catheter and have no fever, and next time and on the same patient you may not be so skilful and successful, you may blunder and hurt the patient and make him bleed, and severe fever will follow. Then, again, it is impossible to practise for many years among patients troubled with urinary disorders without observing that certain nationalities are more prone to this fever than others. The French are certainly much more susceptible than the Germans, and among the British the Irishman is far more likely to suffer than the Englishman. These more susceptible people are certainly the most nervous, this term being used in its highest and best sense, for many

will agree that the Irish and the French are the two cleverest peoples in the world. Even amongst people of the same nation, the more highly trained, the more educated, the more refined the subject, the more likely is he upon due provocation to suffer from this fever. The physician, the poet, and the painter are certainly worse subjects for operation where the urethra is concerned than the labourer and the uneducated classes generally. All these clinical facts prove that the onset of urinary fever is due to nervous urethral shock conveyed to the secreting tissues of the kidneys by the urethral nerves and inhibiting the secretory action of these organs to a lesser or greater extent, producing suppression of urine, from the most complete and absolute to the slightest and most transient possible. In fact, urinary fever is suppression of urine. If the suppression of urine is complete or considerable the kidney naturally becomes engorged with blood, inflammation ensues, and in bad cases suppuration follows, and the patient frequently sinks into a state, often and deservedly called typhoidal, and dies. No doubt this suppuration is more likely to occur if there be surgical impurity in the bladder, and hence the necessity for careful antisepticism from the very commencement of any surgical urinary treatment. My view, therefore, is that while this urinary fever may undoubtedly run on and develop into septicism, it is not, primarily, blood-poisoning. A clear view of this subject will be an excellent guide in practice, helping us to prevent us well as to cure, it will save us from all the dangerous fallacies which result from huge and undigested statistics, from drawing conclusions from operations on one race of people and applying them to all other races, and it will make the history of urinary surgery clear, reasonable, and instructive, whereas without this definite understanding much may appear irregular, uncertain, and extraordinary.

In 1875, when I began practice, a man with a stone in his bladder was subjected to either perineal lithotomy or to lithotrity, and occasionally large quantities of small stones were simply washed out of the bladder by Clover's apparatus, a good instance of this latter operation being published by the late Mr. John Foster in THE LANCET of Oct. 10th, 1874, four years before Professor Bigelow published his paper on Litholapaxy. The woman with a stone was generally cut, and boys and girls were always cut. Lithotrity was unquestionably an unpopular operation. The general surgeon was opposed to it, although Liston, Brodie, and Fergusson had all given it their countenance. Sir Henry Thompson, in his time, was almost alone in

this country, as an advocate and champion of the operation, urging its adoption not as a substitute but as a complement to the operation of lithotomy. Sir Henry Thompson was without doubt the most prominent figure in urinary surgery during the latter half of the nineteenth century, and it will be my earnest endeavour to make clear the part which he has played and the principles which he has consistently adhered to throughout his career. He is happily still amongst us, but I speak entirely on my own responsibility. I speak strongly on this matter, for he has been, over and over again, unworthily attacked by those who, finding that he did not know and foresee everything, have failed to give him credit for the great work which he has done and have not been sufficiently generous to admit how much they owe to him. The early lithotritists of course had to practise without anæsthesia, and they found that patients bore badly the repeated introduction of instruments, and that the more instrumentation they underwent the more severe was the resulting urinary fever. This led Civiale, the father of lithotrity, to inculcate the importance of short sittings and of the employment of great gentleness, and it was with this teaching that Thompson was imbued when he began his surgical career in London. Sir Henry Thompson became emphatically the propagandist of gentleness in urinary surgery in this country. This principle of gentleness is a great one, and is still of vast importance, although the introduction of anæsthetics has made it subject to certain modifications. The lithotrites of 1860 were the ingenious and unhandy instruments of Brodie and Fergusson and the perfect instrument of modern days is entirely due to the suggestion of Thompson and to the mechanical genius of the elder Weiss. No one but the lithotritist can realise the value of the cylindrical handle which they introduced. For some years Sir Henry Thompson practised lithotrity, removing much of the débris between the blades of the lithotrite and leaving the rest to be expelled by nature's efforts, and it was not until 1866 that the late Mr. Clover's name began to be associated with the operation of lithotrity. In THE LANCET of May 11th of that year, he first described his apparatus for evacuating the débris after the crushing of a stone. No one has ever done sufficient honour to the memory of Mr. Clover. He was an Englishman educated at University College Hospital, London, full of ingenuity and resource. His inventions were numerous, and he was a pioneer in the modern art of anæsthesia, and in that art his inventions are still in use and are of great value. In turning his attention to anæsthetics it seems to me uncertain

whether that art gained or general surgery lost the more. At any rate, his apparatus for evacuating stone after lithotrity is unquestionably the prototype of all modern evacuators, and in it lay the germ of the whole of modern lithotrity. It is curious in reading the early literature of this subject to note how right Clover was in everything he taught and pointed out from the very beginning. Twelve years afterwards, when Professor Bigelow of Boston introduced his evacuating apparatus, it consisted of Clover's syringe with a receptacle of glass below and the top connected with the evacuating catheter by a long flexible tube. Clover had taught and explained that the nearer the glass receptacle was to the penis the better, and after more experience Professor Bigelow accepted Clover's teaching and did away with all connecting tubing. Clover taught that the smaller the evacuating tubes, the less water would they contain, and therefore the brisker the current within them. Bigelow's immense tubes have been found unnecessary and Clover's smaller ones have been employed. Clover's tubes were short, Bigelow's were long, and now all our tubes are as short as possible. Every one of Clover's tubes was fitted with that most important adjunct, a flexible stylet. Bigelow's tubes had no such stylet, though he spoke of clearing his straight tubes with a rod, and now no lithotritist would use a tube without its being fitted with a flexible stylet, again showing how right Clover was. Clover's tubes had lateral plates or rings at the distal end. Bigelow's had not these lateral plates which permit of the easy rotation of the tube when in the bladder and of the compression of the penis, rendering the route to the bladder all the shorter ; now every operator uses these plates or rings. I think all this makes it quite clear that even Bigelow himself, and certainly all his followers, had to go back to Clover's principles, and for these principles, I assert, sufficient acknowledgement has never been made to our distinguished countryman. I believe Clover never operated for stone in his life ; if he had been an operator it is more than likely that using his evacuator, and with the assistance of anæsthetics, he would have anticipated Professor Bigelow by 12 years; instead of that he handed his apparatus to Sir Henry Thompson and contented himself with the administration of anæsthetics. The largest of Clover's evacuating tubes is No. 16, English, and I have the pleasure of showing it tonight, for he left a written request that I should have all his surgical instruments. This size is the one I still use. I rarely employ No. 17 or No. 18 and never any larger size. It is quite untrue to say that with Clover's apparatus only a little sand was washed out. With his No. 16 tube large fragments

were removed and the apparatus was a very useful one. At this time (1866) Sir Henry Thompson was beginning to employ anæsthetics during the sittings of lithotrity, but only in private practice. In the hospital he still operated without chloroform, and in employing Clover's bottle there he found that while the patient bore the introduction of the lithotrite in the crushing of the stone with fortitude he would often complain, and that bitterly, when the bladder was distended in the operation of evacuation. This led him, thoroughly inspired with the importance of gentleness and of reducing the urethral shock to a minimum, to employ the evacuator without great enthusiasm. Still the instrument gradually forced itself into his esteem, and when I joined him we took it to every operation and invariably employed it. Our practice then was nearly all in private and the patients, therefore, were always anæsthetised. Here is a letter from Mr. Clover to me dated Jan. 29th, 1882 :—

My Dear Browne,—On referring to my notes I find that I gave the anæsthetic 130 times whilst Sir Henry Thompson performed lithotrity in the years 1876 and 1877, and in nearly all these cases he made use of the aspirator to remove fragments. The exceptions would not amount to 10 per cent.

Yours truly,

J. T. Clover.

During this period both Sir Henry Thompson and I would often crush a stone and wash it out entirely at one sitting. Mr. Clover, in a letter to the *British Medical Journal* of Nov. 16th, 1878, refers to my doing this, but we thought nothing of it, and it was only if a patient suffered severely from cystitis after a sitting of lithotrity that Sir Henry Thompson would, as it were, harden his heart, send for Mr. Clover to anæsthetise, and then and there clear out all the remaining débris, thinking it better practice to subject the urethra and bladder to considerable disturbance rather than allow the irritating fragments of stone to remain. But this was the exception and not the rule, and here we see distinctly that Sir Henry Thompson had the defects of his virtues, for if he had been less gentle he would have been more bold. And so we went on for three years, when in the autumn of 1878 Professor Bigelow proposed to treat calculi within the limits of lithotrity by crushing and excavating *at one sitting*. The principle was soon recognised to be of the very first importance, and taking the profession all over the world as a whole it was accepted with remarkable openness and fairness of mind. There is no doubt that Sir Henry Thompson was surprised when he

found how near he had been to the discovery of this great principle ; we cannot say, without seeing it at all, for he had seen it, veiled, in a mist, but without realizing its greatness and universal applicability. He would doubtless have accepted it at once had not the great principle unfortunately been overloaded by Professor Bigelow with the use of huge lithotrites and of large evacuating tubes. These large instruments offended Sir Henry Thompson's feeling of surgical respect for the male urethra and excited his dread of urinary fever. In my opinion Professor Bigelow was not altogether right or Sir Henry Thompson altogether wrong. As regards myself, I have done my work since 1878 acting upon Professor Bigelow's principle, but with my lithotrites and my evacuating tubes practically unchanged, but employing Professor Bigelow's improvement of Clover's bottle, the improvement in that instrument consisting in putting the rubber syringe above the glass receiver instead of horizontally beyond it, while at the same time I have taken away Professor Bigelow's internal tube, reducing the interior of the tube to its original simplicity. Throughout I have been faithful to Sir Henry Thompson's teaching and have never failed in my respect for the male urethra, always using the smallest instrument practicable and in the gentlest manner. Bigelow's suggestion was, after all, only an extension of Thompson's teaching. Thompson was kind, Bigelow apparently more cruel was kinder still, to the parts concerned. Professor Bigelow, in addition to the use of large instruments, proposed to call his alteration in the method of lithotrity by another name altogether—namely, litholapaxy (λιθος stone, λαπαξω to carry off). This, I think, was altogether a mistake and unfair to lithotrity which was not superseded or rendered obsolete, but simply had its field of usefulness extended. The term "locomotive steam-engine" describes the crude "Puffing Billy" of George Stevenson, but it is quite as applicable to the most modern flyer just turned out of Crewe. Just so an extension of the operation of lithotrity which is still essentially a crushing operation needs no other name. I think, however, as I shall explain further on, that we want another name such as litholapaxy, but not in the sense employed by Bigelow.

It has often been asked, "What is a stone in the bladder?" My definition is that a stone in the bladder is concrete calculous matter which the patient is unable to get rid of naturally. A stone in the bladder may therefore weigh anything from two to three grains to several pounds. Even if a stone has left the bladder and being arrested in the urethra

is pushed back into the bladder prior to its removal, it should still, I think, be considered a stone in the bladder. In fact, directly a renal stone is extruded from the ureter it becomes a stone in the bladder. When once the presence of a stone in the bladder has been detected the best plan to remove it has to be considered. It has not been generally recognised that there are really *three* ways of removing a stone from the bladder. It may be removed by vesical incision, lithotomy; it may be crushed and washed out, lithotrity; and it may be washed out whole through a tube; and it is to this latter proceeding that I would confine the term "litholapaxy." If these three operations are not admitted to be distinct, where, then, are you to put the calculi pumped out through tubes? They certainly cannot be entered under "lithotrity" and they certainly cannot be admitted under the heading of "litholapaxy," if there you record your lithotrities, without obvious unfairness and confusion. When Professor Bigelow established the fact that it was safer to crush a stone and suck out every particle in one operation than by several he wished to distinguish his single-sitting operation from the older and many-sitting one, and being by no means certain (only having an experience by himself and others of 14 cases) that it would entirely sweep away the old method named his operation litholapaxy, which merely means the evacuation or removal of stone. This new term might have been justified if lithotomy had been swept away as well as the old lithotrity, but as this is not the case I propose that the terms "lithotomy" and "lithotrity" shall stand, "lithotrity" meaning Bigelow's lithotrity, and that we confine the term "litholapaxy" simply to those cases where a stone or stones can be pumped out entire through tubes.

Litholapaxy, in my sense of the term, is the simplest and safest of the three methods, and if the stone or stones be small the operator should always attempt removal by means of tube and aspirator, and should only crush if the stone be too large to come through a No. 16, No. 17, or No. 18 (English scale) tube. Lithotrity, that is to say, Bigelow's lithotrity, lithotrity at a single sitting, is the operation for boys and girls, women and men, in all uncomplicated cases of stone in the bladder. Operators vary in skill and experience, and one man may be able to deal successfully with a large or a hard stone which would baffle a less experienced surgeon. Much must depend upon the individual, and the surgeon will be well advised if he subject his patient to lithotomy in all cases where he feels uncertain that he will be able to break and bring away every particle of stone at one single operation, for that is the essence of modern lithotrity.

It is when faced with large stones in elderly and feeble men, and particularly when there has been long-standing prostatic or other obstructive disease, that I think the modern lithotritist should pause. Supposing that the stone is not mechanically beyond the limits of the lithotrite it must be remembered that the old man's urethra ill bears the repeated introduction of large lithotrites and tubes. The prostate may be so disturbed that no urine is passed afterwards except by catheter, and the mucous membrane of the bladder may be so injured that phosphatic deposits readily occur and plague and torture the remaining years of life. In many of these cases the interests of the patient will often be best consulted by the removal of the stone through a suprapubic vesical incision. Then there are many cases where it is impossible to clear thoroughly an old bladder from stone by instruments introduced through the natural passages. There is the post-prostatic or trigonal pouch illustrated by me in THE LANCET of April 18th (p. 867) and 25th (p. 922), 1891; there is the lateral prostatic pouch described and illustrated by me in the *British Medical Journal* of Oct. 12th, 1895; there is the post-trigonal pouch; and there are the regular sacculi, which consist of the protrusion of mucous membrane between the muscular fibres of the bladder. In all these pockets stones or fragments of stone may lodge and may defy the most careful attempts of the best lithotritist, not only to remove them, but even to detect them. The entrance to many of these pouches is very small and can only be got at by a suprapubic incision. Then the bladder itself in many of these cases is actually coated with phosphatic matter which cannot be got away with the lithotrite. I would say, therefore, that if on examining an elderly man his urine is found to be clear and free from pus and the stone is felt to be of uric acid or of oxalate, and not large, say, not over three ounces, it will probably be safe to perform lithotrity. But if the urine is purulent and alkaline, the prostate very large, and the stone large and phosphatic, I think in most cases the best result will be attained by a suprapubic lithotomy.

One of the old axioms in the art of lithotomy was that you should never cut for the stone without having felt the stone with staff or sound immediately before making the incision. The following experience shows that even this valuable old rule has its exceptions and proves what I have just stated, that we cannot dispense with lithotomy. I was called by Mr. Noble Bruce to see an aged gentleman. Feeling sure from his symptoms that he had a stone in his bladder I sounded him and at once came in contact with a stone which

appeared to be one of fair size. I made all arrangements to perform lithotrity, and on the appointed day the patient was anæsthetised and I commenced proceedings, but do what I would I could find no stone. I tried every position of the patient and made rectal pressure in vain. The situation was one of great embarrassment and the anxious friends were eager for the news that all was safely over. After a most patient but fruitless search I was obliged frankly to tell them that I was satisfied that I had not been deceived, that there was a stone there, but that owing to a pouch or pocket of some kind I could not on this occasion even touch the calculus, much less seize and crush it. The patient took a day or two to consider matters and then consented to my performing suprapubic lithotomy. I found an extraordinarily deep post-prostatic pouch and at its bottom a stone measuring five inches in its largest circumference. The patient made a good recovery. It is the difficult cases that must be cut, and it is precisely the difficult cases where suprapubic lithotomy is the operation. I look upon perineal lithotomy as obsolete. No finger is long enough to explore thoroughly the bladder through a perineal incision and even if it be admitted that it is long enough to make a complete diagnosis, it is certainly not long enough to do any work in the bladder, to turn a stone out of a pouch, or to stretch and dilate the neck of such a pouch before getting out the stone. I have had several cases where nothing could have been done from the perineum, but the finger introduced suprapubically was able to get directly to the stone to stretch the neck of the sac, and finally with scoop or forceps to aid in the extraction of the stone. On one patient I was once obliged, in the course of five years, to perform three suprapubic lithotomies. He was an old stricture patient, and 10 years before I saw him had had a perineal section performed. From long-standing urethral obstruction the bladder had become badly pouched. In the trigone of the bladder there was a large pocket, which caught and retained the rather large calculi which constantly came down from the kidney. It was impossible to get these stones away except by suprapubic incision, they could be detected by the vesical sound, but could not be seized by the lithotrite. With reference to the return of stone after operation I do not think statistics are important. It must be remembered that after either crushing or cutting the same constitutional conditions remain, and that the constitution may just as easily after one operation as the other form another stone. The same local conditions will also remain, so that if a phosphatic calculus quickly follows the

removal of a phosphatic stone by lithotrity it does not follow that lithotrity is to blame. If, on the other hand, phosphatic calculus does quickly follow the removal of an acid stone by lithotrity, it is very probable that either the vesical mucous membrane was injured, became inflamed and offered a rough surface for the deposition of phosphates from the urine, or that fragments and debris were left behind. If lithotrity be undertaken it must be on the understanding that the operation must be completely finished, every particle of the stone must be removed. For this purpose it will be well to fragment and not to pulverise the stone. Pulverisation has been recommended, but this fine sand or mud is very difficult to entirely remove, it gets entangled in the mucous membrane and attracts phosphatic deposit, while fragments come away easily and are less likely to be left behind in the bladder. If a surgeon has been led by error in judgment to perform lithotrity in a case not altogether suitable for the operation, and if he thinks he has unavoidably left some particles of stone behind, or, indeed, if he has the least suspicion that such may be the case, I advise that in four or five days after the operation, either with or without the aid of an anæsthetic, an evacuating tube be introduced and an aspirator applied. It will be found that particles difficult to get away at the time of the operation will have become loosened and will come away readily. It is often justifiable to undertake lithotrity even when all the conditions favourable for lithotrity are not present. The patient may be too feeble for the surgeon to think him fit to bear incision. In these cases a second or final sitting of lithotrity to ensure as far as possible the removal of every particle of stone will be a wise proceeding. We thus see that in surgery, as in nature, there are no hard-and-fast lines of demarcation, few absolute rules, and that the rule of modern lithotrity to remove a stone at one operation has its wise and very proper exceptions. When the stone is very large I am altogether in favour of suprapubic lithotomy. By this incision we have complete command of the bladder, there is little hæmorrhage, the stone is easily manipulated and, if necessary, can be broken up and washed out. The delivery of a large stone suprapubically is not always an easy proceeding. I do not like forceps, which are apt to project beyond the stone, and so unnecessarily tear the bladder. The best instrument is a scoop, placed well under the stone, while the stone itself is steadied by the operator's left forefinger. There are many forceps for breaking up a stone after the bladder has been opened by the knife, and there is no reason why Forbes Keith's giant lithotrite should not be used in this

situation rather than from the perineum as practised by him.

India has for centuries offered an unrivalled field for the performance of stone operations and there are surgeons there who can boast of such lists of cases that no surgeon in Europe or America can expect to equal. Dr. D. F. Keegan writes: "We need not look to England or to any country in Europe for guidance"; and it is he who has been chief in establishing as one of the principles of lithotrity that it is as applicable to children as to adults. Upon his suggestion the smallest tubes and lithotrites have been made, and children of the tenderest years, and even months, are now relieved of their vesical calculi without the knife. Dr. Keegan's teaching, I am satisfied, is as applicable to all as it is to Indian children, but when we come to adults, where the nervous system becomes involved through the sexuality of the urethra, and when the bladder from long-standing prostatic trouble becomes malformed and diseased, then I am satisfied that Indian experience will prove a false and dangerous guide. To paraphrase Dr. Keegan's remark, we need not look to India for guidance. I have been found fault with for speaking of the tolerance of the Indian bladder. I have used the phrase in no carping spirit, for I have sincere admiration for the brilliant work of our Indian surgeons in calculous disorders; but when these surgeons tell us that we make too much of sounding for stone, that it is a trifling affair and needs no special care; when they tell us that vesical pouches and sacculi are easily cleared by the lithotrite of stone and that there is no need to lithotomise; when, indeed, they attempt to teach us that there is no need for lithotomy at all and that it is obsolete, then I say it is clear to me that they know little of the sensitive European or American and have failed to realise all the vesical troubles of extreme old age. The average stay in hospital of Dr. Keegan's adult cases was only 5.3 days—far too short a time for safety in England. Dr. Forbes Keith in his interesting paper on the Complete Abandonment of Lithotomy[1] relates such cases as the following. Case 1.—A native, aged 60 years, had his urethra opened by perineal incison. A phosphatic calculus, weighing two ounces, was crushed, and the bladder was evacuated of débris by instruments, some as large as No. 20, passed through the perineal wound. He went home cured on the third day. Case 2.—A youth, aged 18 years, afflicted with a huge vesical calculus, was so ill that after consultation with colleagues it was thought that operation must be followed by death. The

[1] The Lancet, Sept. 30th, 1893, p. 800.

urethra was opened from the perineum, a lithotrite was passed through the wound into the bladder, and the stone was seized and broken up by the repeated blows of a hammer. Three ounces of débris were removed and after two hours' work the patient was put back to bed. Four days afterwards the remaining four ounces of stone were similarly attacked and removed in one and a half hours. In three days the patient left the hospital, passing all his urine by the penis and being free from pain. No English urinary organs could be subjected to such treatment and recover in the time mentioned. To English surgeons this vesical tolerance in India is wonderful ; we watch and we admire, but we must not be tempted to imitate. I am convinced that if we do we shall push lithotrity to dangerous extremes and bring it into discredit. Lithotomy will continue to live, it has existed for thousands of years. It is the useful partner, not the jealous rival, of lithotrity and litholapaxy.

LECTURE II.

Delivered on Nov. 14th, 1901.

MR. PRESIDENT AND GENTLEMEN,—Great improvement has taken place in the treatment of enlargement of the prostate gland during the last quarter of a century. When I began practice antisepticism as applied to catheterism was unknown, and the great success of modern treatment is undoubtedly based upon attention to antiseptic detail, better surgical instruments, and greater skill and knowledge in their employment. Particularly of late, as a background for the display of would-be remedial operations, the prospects of the prostatic patient have been painted in the blackest possible colours. I believe all this to be a mistake. No doubt by a patient's neglect of himself, or by error in surgical treatment, intense cystitis may be brought on, resulting in much suffering; but even this is remediable by simple means, whereas if the patient be not careless, and if he be judiciously treated, I would say that he was more likely than not to live to a considerable age, for I have the greatest respect for the average prostatic patient's constitution. The prostatic patient is often remarkable for his energy, force of character, intellectuality, and general success in life. The prostate is a sexual organ and it appears to exercise no urinary function whatever, although learned papers have been written upon its urinary importance in health, the apparently obvious fact being overlooked that women perform their urinary functions very well without it.

Why the prostate undergoes enlargement is not very clear and no satisfactory theory has yet been brought forward. I think the affection is more common among the sedentary and well-to-do, but it is found amongst men who are the very reverse of this. It certainly is often seen after a second marriage, or after a marriage late in life; but, on the other hand, I have met with great enlargement in men remarkable for their life-long asceticism, celibacy, and piety, so that with

regard to the etiology of prostatic enlargement one feels still at sea. If pressed, however, to advise how best this malady is to be avoided I should advise plain living, exercise on foot, and very moderate worship at the shrine of Venus after 50 years of age. It has often been remarked in writings on the enlarged prostate that if a prostatic patient who fails to empty his bladder be left alone a time comes when cystitis occurs and the urine becomes cloudy and offensive. This is not so in the vast majority of cases unless instruments have been used, and almost always is due to some imperfection in the antisepticism employed.

We will therefore begin by a consideration of the practicable antiseptics of catheterism. I believe the strictest and greatest authorities on antiseptics allow that there is no perfect antisepticism, and that antisepticism is an attempt only at perfection. Nature allows and provides for a certain amount of error. It remains for us, therefore, to find some system which is sufficiently perfect to avoid infection of the bladder, and at the same time sufficiently simple to be practicable for the busy patient who is engaged in all the ordinary duties of life. For many years I have provided the patient requiring the use of the gum elastic or rubber catheter with the following outfit—a tube of antiseptic pellets (one of which dissolved in a pint of boiled water yields 1 in 1000 of perchloride of mercury); a pint bottle; a glass tube 13 inches long, one and a quarter inches in diameter, fitted with a cork and stand; a box divided into seven compartments, each compartment holding a catheter, and labelled after the days of the week, made of cheap material so as to be burned when soiled, and easily replaced, or of tin, and therefore easily purified by boiling; and a pot of plain white vaseline, or with the addition of 5 per cent. of oil of eucalyptus. In his bedroom the patient is directed to keep a vessel with a lid, filled with water which has been boiled, and a supply of clean, small, soft, rough towels, so distinctive that they cannot be used except by accident for ordinary purposes. The patient dissolves a pellet in the pint bottle filled with boiled water, and from this pint he fills his upright glass tube. We will suppose that his catheters are handed to him in a pure state. He uses a catheter at bedtime, withdraws it, wipes it, and then washes it in soap-and-water, and places it in the upright tube for the night. The catheter being upright in the tube, the inside is thoroughly exposed to the antiseptic solution, and there is no need to have interiors of catheters smooth and polished, as has been proposed, and which adds to their expense. If the catheter has been put into the tube at bedtime it can be taken

out the next morning, rinsed in water which has been boiled, dried, and put away in its compartment in the seven-compartmented box until its day for use comes round again. If a catheter is required four or five times in 24 hours it can, after each using, be washed and put back into the tube during the day of usage, although it is found in practice that simple washing during the day is sufficient if the catheter have its antiseptic bath at night. Men engaged during the day away from home and travellers carry two or three or more clean catheters in little metal boxes (which can be boiled) in their pockets, transferring the catheters when used to another pocket, and waiting until evening and their bedroom is reached before washing them all, and placing them in the antiseptic solution. One tubeful of perchloride solution will purify five or six well-washed catheters. Gum-elastic catheters by good makers will bear 12 hours' immersion in 1 in 1000 of perchloride of mercury well, and carefully used in this way will last for years. Vulcanised indiarubber catheters may, if desired, be left in this antiseptic bath altogether without sustaining any injury. The receptacle for the lubricant employed should be small, so that the latter is frequently renewed and the former should be frequently cleaned. The glans penis must be kept clean with soap-and-water and the hands well washed. If these simple directions be carried out the urine will keep sweet and clear and cystitis will never be set up. All metal instruments, such as silver catheters and vesical and urethral sounds, should be boiled. No prostatic patient should be touched by any instrument which the surgeon is not perfectly satisfied with and would not use if necessary upon his own person, for if one impure contact be made the patient may never be the same again and it may be the starting-point of almost endless trouble. At one time I thought that the bladder never became infected unless impure instruments had been used, but I have had occasion to change this view, having found bacterial urine in the male bladder virgin to all instruments, but this is very exceptional, and we must insist upon practicable anti-septicism in urinary surgery.

When an elderly man requires the use of a catheter it may be that he simply fails to empty the bladder by his natural efforts to the extent of a few ounces, or that he has an acute attack of retention of urine, or that he has for a long time failed to empty the bladder, that organ having become distended and containing habitually a large quantity of urine, the urine passed naturally being simply overflow. But whatever the precise reason for the catheterism the patient may be said to be standing on the brink of a precipice and the surgeon who

comes forward to lead him to firmer and safer ground must act from the very first with caution, otherwise it is possible that both surgeon and patient may fall into the abyss, the patient losing his life and the surgeon his reputation. In other words, the absolutely necessary catheterism may result in illness leading to the death of the patient and to the destruction of the surgeon's reputation as a healer of men. Here, just as in the surgery of stone, we are face to face with urinary fever, and we must act from the very outset so as to avoid it if possible. Instrumentation must be gentle and skilful and the patient be kept warm and quiet, for exposure to cold and shaking of the body, as in travelling, both tend still further to embarrass the renal action, if it has already been disturbed by catheterism. Therefore, it is always well to attend the patient in his own warm room, and elderly, feeble men should be kept for a few days altogether in bed. If a patient has sought advice in time and has been properly attended to, he will probably never have complete acute prostatic retention of urine, and certainly will never come to the chronic state of retention of urine where the bladder is full, and the urine dribbles away. If a patient comes to acute retention of urine he certainly has to be introduced to the catheter under the most unfavourable circumstances and with very little ceremony. The bladder must be relieved as speedily as possible, for the longer the retention the less likely is the bladder to regain its contractile power. It is in these cases that so often great difficulty is experienced in passing a catheter, and catheterism proving unsuccessful, the patient is subjected to some formidable operation. We often read in the medical press statements of which the two following are fair examples. A surgeon writes of his patient, aged 81 years, suffering from retention: "The prostate as felt per rectum was enormously enlarged, and no catheter could be passed, the growth blocking the urethra completely." Another surgeon writes of his case: "After this it was impossible for two days to introduce a catheter." In both these cases the patients were promptly castrated. Now in such cases as these there is no doubt as to the existence of a urethra from meatus to bladder. I take it that there was no urethral stricture, and I do not admit that there is such a thing as prostatic stricture; therefore, the only reason why a catheter did not pass along the urethra and into the bladder was that the canal was tortuous—that is to say, irregularly bent and winding; and it is obvious that, given faith, determination, and skill, which in this connexion is only another term for experience, it must really have been possible to pass

catheters into these bladders. I wish, indeed, to take this opportunity of asserting most emphatically *that there are no cases of prostatic disease where it is impossible to pass a catheter into the bladder.* When once a catheter is passed the patient is on the high road to recovery and he is spared the risks of severe surgical procedures when, owing to his state of health and his age, he is particularly ill-fitted to be the central figure in an operation scene and at a time when "the keepers of the house shall tremble, and the strong men shall bow themselves, and the grinders cease because they are few, and those that look out of the windows be darkened." If a catheter will not pass readily in a case of prostatic retention it will be because the forward curve of the vesical end of the urethra is too acute for the instrument to follow it, or because the point of the catheter has caught in one or other of the two prostatic sinuses on either side of the caput gallinaginis. These sinuses form most perfectly contrived pockets or traps which receive the point of the instrument and effectually bar its onward progress into the bladder. When, therefore, the introduction of the catheter is arrested in these cases the point impinges upon the posterior wall of the urethra or is caught in one of the pockets situated in that wall. It follows that for successful introduction the point of the catheter must hug the anterior wall of the urethra, and so the whole art of catheterising the prostatic urethra with soft instruments consists in making their points avoid the posterior wall. In successful prostatic catheterism one of two things always occurs, either the catheter takes the form of the urethra or the urethra that of the catheter. In the first case, when the catheter conforms to the urethra, the instrument must necessarily be a soft one, and when a soft one is employed it is undoubtedly better for the patient. The indiarubber catheter is the safest of all and will often pass when all others have failed. Indeed, Mr. Jonathan Hutchinson (the introducer of the rubber catheter) considers that there are no cases where it will fail and in his skilful hands it has been a great success. It will be well always to begin with these catheters. But in my experience, especially if other instruments have been previously unsuccessfully attempted, this catheter may not always pass, and it will then be well to try the coudée catheter, keeping the beak well upwards all the way in. Then in point of usefulness comes the bicoudée catheter, which is a very efficacious instrument, especially when the difficulty arises from the prostatic sinuses. The olivary catheter and the English gum catheter are rarely of use in cases of real difficulty. The value of the rubber and of the coudée catheter

may in certain cases be much enhanced by the use of a metal stylet. Metal stylets are of three kinds—iron, lead, and silver. The iron stylet gives form and strength to the main body of the catheter, while the end of the catheter may be left free to follow the curve of the urethra. The leaden wire gives substance and backbone to the catheter without rigidity, and I know no more invaluable instrument in cases of great difficulty than a rubber catheter fitted with a leaden stylet stopping short of, say, three inches from the eye of the catheter. The silver stylet occupies a position between the other two; it is very yielding and at the same time full of spring, and if well curved will often carry a soft catheter safely through a greatly deformed prostatic urethra, when the curve forwards close to the bladder is very acute. If no soft catheter, either with or without a stylet, can be passed, then we must make the urethra conform to the catheter; in other words, we must use a silver instrument. The very worst cases can always be relieved by a silver instrument if the patient be anæsthetised and if the surgeon guide the point of the instrument with his left forefinger in the rectum. I have found a large silver catheter, No. 14, with a short curve and fitted with a gum stylet very useful. It is too large and blunt to catch in the prostatic sinuses, and the short curve comes readily forward on depressing the shaft of the instrument. The gum stylet is useful in preventing plugging of the catheter from blood-clot. After the bladder has been emptied a soft catheter can always be passed in if moulded on an iron stylet to the exact shape of the successful instrument and tied in.

But the most grave and anxious cases are those where the retention has been allowed to become chronic. The bladder, by percussion, can be discovered high above the pubes and the urine constantly dribbles away. No surgeon should consent to treat such cases as out-patients. It must be explained to the sufferers that the necessary treatment is as important and as delicate as the most formidable operation in surgery; they must be sent to bed and told that they will have to stay there two or three weeks. In such cases catheterism must be commenced with care and with every antiseptic detail and the bladder should only be very gradually emptied. I generally practise catheterism every six hours and if about 17 ounces be drawn off each time it will be seen that supposing the original contents of the bladder to be 40 ounces it will take four or five days before any one catheterism empties the bladder. If any pain be experienced towards the end of catheterism the catheter should at once be withdrawn. If these largely distended bladders are suddenly emptied there is almost sure,

within a few hours, to be some hæmorrhage from the vesical veins which have been too suddenly relieved from a condition of chronic and severe pressure, the kidneys suffer severely from the shock, urinary fever follows, and the patient almost invariably dies; while if these bladders are only slowly emptied there may not be a rise of temperature, and, if I may so express myself, not even a pus or blood corpuscle may be seen throughout the treatment. All depends upon close and constant surgical attention and perfect submission on the part of the patient. If a prostatic patient be properly introduced to the catheter, and, if necessary, continues to use it with care and cleanliness, his prospects of life are good. The discipline alone is useful; he learns to live punctually and by rule, and necessarily avoids the excesses and indulgences which often bring other men to grief. A man dependent upon his catheter is by no means debarred from great activity, and instances are numerous of men active in politics, law, medicine, and in the Church, distinguished in the work of scientific research, and even as sailors and sportsmen, who are in this condition. I have known many such cases get well on into the "nineties," and even then it has not been to the condition of their urinary organs that they have succumbed but to complaints or accidents of an entirely different nature. I have only just lost an old patient who was born in 1806: his prostate was enormous, and I had to have catheters 17 inches long made for him; and I have another patient born in 1803 who is still alive and active and who has long been entirely dependent upon the catheter. Still, there are the exceptional cases, where there are unusual difficulties and sometimes complications, and where simple catheterism will not alone suffice or is impossible. These are the cases which have been unfortunate in their introduction to the catheter, where cystitis and possibly intense irritation have been set up—cases where catheterism is very difficult and where auto-catheterism is well-nigh impossible, owing to blindness, shaking palsy, crippled hands, and even the loss of a hand. These latter difficulties are of course got over by securing, whenever possible, the services of a good attendant. Then there are the cases where the prostate is very much enlarged, and often enlarged into the bladder, the prostatic projection acting like a foreign body and causing great irritation, and cases where, hidden away, but none the less irritating and torturing, there is a stone in the bladder, not to be detected by the ordinary method of search by a sound introduced through the urethra. A prostatic case, where the calls to empty the bladder are constant, and where perhaps catheterism is

difficult and painful, and the relief obtained by catheterism evanescent, and where no vesical calculus can be found by the ordinary methods of examination, should in the first place always be thoroughly made a patient. He should be kept at rest in a warm room. His catheter should be introduced rather too often than too seldom, and by a skilled attendant. The bladder should be washed out by mild solutions of nitrate of silver, boro-glycerine, or glycerine and borax. Antiseptics should be administered by the mouth, such as boric acid or urotropine, and the bowels should be kept gently active If the case is one of simple inflammation the improvement which may take place is often astounding, and the improvement can often be rendered permanent by the patient learning exactly how to take care of himself. But if improvement does not take place a careful examination should be made under an anæsthetic ; a calculus may in this way often be detected, while the extent of the prostatic growth may be defined by the finger in the rectum and the sound in the bladder. During such an examination it will be well also to use an evacuating-tube and lithotrity aspirator in order to wash out any irritating phosphatic concretion which may have eluded detection by the sound. If a stone be found it can be crushed and removed, unless for any special reasons it is thought better to perform lithotomy.

Supposing, however, lithotomy is not performed and that, in spite of all that is done so far, the patient's difficulties continue, it becomes a question what the next step should be. Many would under such circumstances recommend vasectomy, and others, bolder still, would advise the removal of the testes. Now nothing that I have ever met with has recommended these operations to me. I have never performed either of them, for I have seen so many patients after these operations not one whit the better for them, but in many ways the worse, that I have put them aside as even worse than useless. The following are fair specimens of many of my experiences. In a clergyman, aged 66 years, great irritability of the bladder came on in 1893 and a large prostate was discovered. He was submitted to double vasectomy. In 1897 he came to me suffering much. He held urine for two hours in the day and occasionally could go three hours at night. He had pain during and after micturition. He used a catheter occasionally "to draw away clots of blood," but there was no urine to draw off after an act of natural micturition. By rectum the prostate was felt to be enormous. On sounding a large stone was found in the post-prostatic pouch. Lithotrity was performed and all his symptoms vanished. He left me well, with no retained urine, but

catheterism was always followed by prostatic bleeding, showing that besides being very large the prostate remained highly vascular in spite of the vasectomy. It may be merely a coincidence and not a consequence, but it is right and fair to say that I afterwards went to hear this clergyman preach and I was sorry to find that his voice was unequal to his task. In another case the patient was aged 78 years. He had been taken with complete retention in Switzerland. Catheterism there was found to be impossible. Both vasa deferentia were tied and the bladder was opened suprapubically and a tube put in. Eventually he travelled home with his Swiss medical man, wearing a metal suprapubic tube, and came to me in October, 1897. I found the prostate enormous. I passed a catheter in the presence of the Swiss practitioner and tied it in, removed the suprapubic tube, and eventually healed up the opening. He had three years of comfortable life afterwards, but never ceased to be entirely dependent npon his catheter. Towards the end of 1900 I found him very ill indeed in the country and complaining of much penile pain. This pain was due to a phosphatic calculus which I removed, but he was worn out and died at the age of 81 years. The prostate remained of great size to the end. I saw this patient with Mr. Joseph Birt and Mr. E. H. Sweet.

It seems to me that castration and vasectomy have recommended themselves to surgeons largely engaged in hospital practice, where they see acute cases of prostatic trouble in patients who are poor and quite unable to take even ordinary care of themselves. These patients are operated upon, and their condition, perhaps in some cases, somewhat improved, the result really being due to the care exercised in catheterism and the rest and management while in hospital. It is forgotten that prostatic patients have their ups and downs even under the most favourable circumstances. I have known a patient after a bad prostatic retention to be entirely dependent upon his catheter for 12 months and then gradually to recover all his power, until now I know that he has not used a catheter for years. Such a case if subjected to castration, had he survived the shock of the operation, would have been put down entirely to the credit of the operation. I believe that castration does no real good in genuine cases of prostatic enlargement, and I know that it is fraught with grave dangers. Many patients become insane, many become decrepit, and many sink altogether under the operation. I must say that it does seem unreasonable to associate prostatic enlargement with sexual stimulus, precisely at a time of life when all the sexual forces are naturally on the wane. I

believe that the whole man depends largely as regards his character, energy, and emotions upon the condition of his testicles. In fact, to emasculate is taken to mean to deprive of strength, life, and spirit, and I have much sympathy with the poor patient who, when recommended to submit to castration, said he would rather die first. The same remarks apply to vasectomy, and as for single vasectomy, it certainly appears to me that such an operation ought never to be performed. I have known it performed in at least two cases upon comparatively young men, and both complained to me of loss of sexual power.

I am satisfied that there is only one thing to do for a prostatic patient whose sufferings cannot be cured or mitigated by the treatment already discussed, and that is to open the bladder suprapubically in order to explore digitally for stone or tumour and at any rate to obtain drainage and rest for that organ. No attempt should be made by the perineum, but the bladder should be opened above the pubes, where, however large the prostate may be, the finger can reach every nook and corner of the bladder and deal with whatever may be found. I would, in passing, point out the importance of opening the bladder in such cases upon the point of a staff. When the prostate is large that organ often comes up well above the pubes, and unless a staff is employed it is possible to incise the prostate and not the distended bladder and thus cause serious embarrassment and trouble, It is quite curious how often a bad prostatic case will prove to be really a case of calculus often hidden away in one of the many pouches to which such cases are subject. When once the finger is in the bladder these stones with care are easily found and generally easily turned out, and the case, from being one of anxiety, uncertainty, and even disappointment, becomes a brilliant success. If a stone be found and the intra-vesical prostate is not very large the prostate had better be left alone; but if there be much intra-vesical growth it will become a question for the judgment of the surgeon whether or not it should be attacked and removed. If no stone has been found and there is considerable intra-vesical growth I think it will be good policy to attack the growth. By this I mean the performance of the modern operation of prostatectomy. Prostatectomy is an English operation and was first systematised and brought before the profession in 1889 by the late much-regretted Mr. A. F. McGill, then surgeon to the General Infirmary of Leeds. It is true that Dr. Belfield of Chicago had successfully removed a middle lobe of the prostate by the suprapubic route in 1886, but of this Mr. McGill was unaware, and as the

middle lobe had often been torn off by accident and by design by forceps introduced through a perineal incision there was nothing very novel about Dr. Belfield's operation. The systematic way, however, in which Mr. McGill proposed to the profession to open the bladder suprapubically and remove all obstructing prostate was entirely a new departure for which his memory deserves full credit, and the procedure may well be termed "McGill's operation." Mr. McGill laid stress upon nine special points in the technique of his operation, and it is only just and fair to him at the present moment to quote his own words from his seventh paragraph. "The prostate should be removed as far as possible by *enucleation* with the finger and not by cutting. The mucous membrane over the projecting portion having been snipped through the rest of the operation is completed with finger and forceps." From the practical surgeon's point of view the enlarged prostate pathologically is found to be either fibrous or adenomatous, and it is the latter condition which offers itself most readily for removal, large masses of pancreas-like substance readily being enucleated by the finger. In both these conditions the prostatic hypertrophy may be either (1) extra-vesical; (2) intra-vesical; or (3) both extra-vesical and intra-vesical. It is the intra-vesical growth which chiefly causes difficulty in micturition. This intra-vesical growth is often like an egg projecting into the bladder, with the vesical urethral orifice at the apex of the egg. In such cases the projection is usually equal to an eighth, or a quarter, or even half of an ordinary hen's egg. This ovoid projection may be deficient at any part of the urethral circumference. When wanting anteriorly and laterally we have the so-called middle-lobe enlargement with which all are so familiar where from behind the urethral orifice there is a projecting prostatic mass acting like a bullet valve and often causing the bladder to be entirely dependent upon the use of a catheter for the voidance of its urine. More rarely we have the ovoid projection only wanting in front and we have then a prostatic growth continuously surrounding the vesical urethral orifice on both sides and behind, or the projection may be only on one side; in such cases it is nearly always continuously combined with a posterior enlargement; while, so rarely as practically never to be met with, the intra-vesical growth is only found anterior to the urethral orifice. Intra-vesical prostatic outgrowths may be associated with considerable extra-vesical enlargement and the latter may exist without the former and cause the patient so afflicted to be partially or completely dependent upon his catheter. In my opinion it is the intra-vesical growth which

can be removed with reasonable safety. The vesical urethral orifice should be left with nothing surrounding it, but level and continuous with the floor of the bladder. No doubt large adenomatous growths are often met with which can be turned out with the finger for some way down along one side or other of the urethra, but the less the urethra is injured the better, and the prostatic plexus of veins lying inside the true prostatic sheath (recto-vesical fascia) ought not even to be approached. Large masses of prostate have been successfully removed. I operated in 1889 on a man, aged 87 years, and removed four ounces in weight of prostate which I exhibited before the Clinical Society of London. Some surgeons have indeed successfully scooped out such very large masses entire that they have thought that the whole prostate has been removed. Quite lately, although prostatectomy has been a recognised operation for 12 years, there has been much discussion about the "total extirpation of the prostate" by enucleation, and it has been heralded as a new and most promising operation in operative surgery. But surely such phraseology is misleading and no anatomist would use such terms. The prostate can no more be extirpated without the use of the knife than can a piece of intestine; it is absolutely one with the urethra and bladder. The assertion was also made that the prostate could be shelled out and the urethra left uninjured. A little thought will show this to be impossible. The prostatic urethra is the prostate itself; the spongy body ends at the bulb. You cannot even peel the mucous membrane away from the prostatic urethra if you have the organs on a plate before you, much less can you do so with the blunt end of your forefinger groping at the bottom of a deep wound. The mucous membrane is not loose as it is in the œsophagus, but is adherent and bound down as in the intestines. We were also told that the prostate had been enucleated without injury to the seminal ducts, to the prostatic veins, and to the prostatic capsule. In his masterly work on anatomy Professor Thane, in describing the recto-vesical fascia, says it meets the side of the bladder along the line of its junction with the prostate and there divides into two layers; the upper unites with the muscular coat of the bladder, the lower is continued downwards, forming the sheath of the prostate, and at the apex of the gland joins the triangular ligament. "In the angle between the two layers and between the sheath and the substance of the prostate are contained the large veins of the prostatic plexus, *but these structures are so closely united by dense connective tissue that the prostatic sheath can only be dissected off the gland with difficulty.*" (The italics are mine). It is obvious

that such a dissection cannot possibly be made with the end of finger, unassisted except by pressure from without, and groping at the bottom of a deep and bloody wound, even if it were safe to attempt to make it. It is quite clear, I think, that the phrase "total extirpation of the prostate" has been used in error and by surgeons who have been fortunate in having only met with the simpler or adenomatous form of prostatic enlargement, where large masses are easily shelled out.

Then, again, in connexion with prostatectomy, it has been denied that when the bladder has long been dependent upon the catheter, say for 12 months, it can regain its natural expulsive power when the prostatic obstruction has been removed. I have, however, been able conclusively to prove that this denial is not correct. I have proved that the bladder can act naturally and completely, and for many years, too, after the removal of prostatic obstruction, and I proved it by the public exhibition of a case, about which there could be neither doubt nor cavil, before the Medical Society of London on March 6th, 1893. My patient had used a catheter for 20 years, and for 10 years had not passed a drop of urine except by catheter. On account of great vesical troubles I opened the bladder suprapubically on March 10th, 1892. I removed a small stone weighing nine grains, and then removed the collar of prostatic tissue which projected into the bladder below and on both sides of the urethral orifice. When shown before the society 12 months after the operation the patient was seen to be well and comfortable and all his urine was passed by his natural efforts. I am glad to say that now, in his eighty-second year, nine years after the operation, he is able to write me that he is in very good health and that no catheterism has been necessary since he left my care. This case is a very happy and successful one and shows what can be accomplished, but we must not forget that the operation is a grave and dangerous one, and I have found no reason to change the views I expressed when I exhibited the above case in 1893. These views may be summed up as follows. Firstly, I believe that suprapubic prostatectomy should never be undertaken at the outset of catheter life unless regular auto-catheterism is difficult or well-nigh impossible. In cases of real difficulty I have seen several patients where vasectomy has been performed, and there has been no lessening whatever of the catheter difficulty. It must be understood that I believe that cases where regular catheterism is impracticable are very rare, and it is for these only that I would recommend suprapubic prostatectomy. Secondly, prostatectomy should never be undertaken as long as the ordinary catheter life is a tolerable one

Thirdly, if catheter life becomes intolerable, suprapubic cystotomy should be resorted to. By means of this proceeding the bladder can be thoroughly explored and any stone removed, which in these cases may easily have escaped detection by the more usual methods of examination. The prostatic growth can be fully examined and removed if the operator think it right to do so. If he deem removal inadvisable he can leave the patient with a suprapubic tube for permanent after-wear with the certainty that he will have materially improved the condition of the patient. Finally, should the operator decide to remove the prostatic obstruction there is a very good prospect, but not a certainty, of the power of natural micturition being restored to the patient. I would therefore strongly recommend all prostatic patients and their advisers to be content with the catheter life as long as it is tolerable, and in the vast majority of cases, with reasonable care, it will remain tolerable into extreme old age—until the end comes probably through other channels. I believe that, as Mr. Jonathan Hutchinson once said to me, "good surgery may often be combined with bad practice." The work of the world is not always done by those who are completely well. It is not wise for the elderly to run grave risks only on the chance of obtaining complete comfort. There is much truth in what Thomas Hardy says of one of his most fascinating heroines: "In considering what she was not he overlooked what she was and forgot that the defective can be more than the entire."

LECTURE III

Delivered on Nov. 21, 1901.

MR. PRESIDENT AND GENTLEMEN,—I propose in this last lecture to consider some of the complaints which particularly concern the male urethra. The most important one is certainly urethral stricture. I well remember Mr. Erichsen, afterwards Sir John Erichsen, lecturing to his students nearly 30 years ago and telling us that a urethral stricture was almost the greatest surgical trouble that a man could have, and when we look back and consider the really fearful methods of treatment in vogue during the early part of the last century and the dangerous operations to which patients were subjected, and which even now linger amongst us, his remark is quite justified. Happily great changes have taken place and the treatment of certain disorders of the urethra has been so modified and changed that urethral strictures are undoubtedly less severe than they were and less frequently met with, and when met with are so much better treated that the modern stricture patient, if he is willing to submit to a very mild and gentle discipline, may usually view his future with perfect calm and equanimity. Strictures of the urethra may clinically be divided into two great classes—those which readily yield to dilatation and which can be kept open by the easy and periodical introduction of a bougie, and those which cannot. It is this latter class of stricture which I propose to consider to-night—that is, those which do not yield to dilatation.

It may be asked, Why should anything more be done if a patient can manage to pass his urine and if his stricture will admit a small bougie? Apart from the constant danger of complete retention of urine, there is always the possibility at any moment of a urethral abscess, which is probably at first a peri-urethral abscess, with all the subsequent dangers and troubles of urethral fistulæ, and even if no abscess forms, it

is certain that in time serious vesicle trouble will arise, the bladder may as it were give up the struggle and become atonied, or it may become inflamed, contracted, and intensely irritable, the kidneys will become pyelitic, and finally there will be interstitial nephritis, suppuration, and death. It was once my misfortune to watch a case for nearly 20 years where a distinguished man of science could never summon up courage sufficient to face the ordeal of a surgical operation. By occasionally passing a No. 1 gum bougie he was able to pass his urine, and a catheter of the same size relieved an occasional retention, but the patient's life was made miserable by increasingly frequent attacks of rigor and urinary fever, and after many years of chronic suffering he sank from complete renal failure. This case has much influenced my practice ; the stricture dominated and spoilt the latter half of this poor man's life and determined me never to allow another case of tight stricture to continue unrelieved, without strong protest at any rate from me. I would say that if in a case of stricture a bougie as large as No. 8 or No. 9 English scale cannot be regularly passed, and passed with ease and comfort, something more radical must be attempted. This more radical treatment has very much occupied the minds of surgeons for the last 50 years.

On Nov. 13th, 1852, Professor Syme addressed a letter to the Imperial Academy of Medicine in Paris on this subject, and stated: (1) that there is no stricture truly *impermeable*, and that, if a drop of urine is able to escape, with time and care an instrument may be passed through and serve as a guide for the knife ; (2) that all strictures which cannot be remedied by simple dilatation admit of effectual relief only through a free division of the contracted part of the canal; (3) that the object can be attained with certainty and safety only by an external incision, in a line corresponding with the raphe of the perineum, upon a grooved director passed through the stricture ; (4) that the only after-treatment required is the introduction of a catheter during 48 hours, with the subsequent use of a full-sized bougie at distant intervals; and (5) that the operation, if properly performed, is free from any risk whatever of hæmorrhage, extravasation of urine, or of fistulous opening.

Coming after Syme, Sir Henry Thompson accepted his teaching, that to ensure a good result from an incision into a stricture the stricture must be freely divided, but he thought Syme's method unnecessarily severe. He soon satisfied himself that a stricture could be thoroughly divided from the inside with greater ease and less risk to the patient

than from the outside, and he has unquestionably established internal urethrotomy upon a scientific and surgical foundation.

The history of the exact inception of internal urethrotomy is a little obscure, but it is certain that in 1827 an English surgeon, Mr. Stafford of London, first brought forward his urethrotomes, which are undoubtedly the prototypes of all later instruments.

About 1865 the forcible rupture of stricture, generally called Holt's operation, attracted a good deal of notice; it consisted in passing through the stricture a small railway, along which a metallic wedge was suddenly pushed in with considerable violence, and the fibres of the stricture ruptured. I often saw this done in my early days. It was an operation founded upon thoroughly unsurgical principles and practised by those who would have had no sympathy with the views of the real nature of urinary fever which I enunciated in my first lecture. I hope and believe that the operation is now dead and thoroughly forgotten.

Then in the late "seventies" came the treatment of stricture by electrolysis; it was introduced with great *éclat* at one of our London societies. I think some 50 cases at first were published, and everyone was said to be perfectly successful; there was not a single failure amongst them all. I pointed this out at the meeting as a suspicious sign, but the treatment was taken up vigorously and papers and books full of successes were published by surgeons of position. Where is the treatment now? Gone like "Hans Breitman's barty."

Of all these treatments internal urethrotomy is the operation which I believe has come to stay. It is, in my opinion, the one treatment for all strictures which will not yield to dilatation. I will briefly state what I mean by internal urethrotomy. I mean the free division—no scarifications, no nicks, no multiple incisions—but one bold, free stroke of the knife through all the fibres of the stricture in the floor of the urethra, since almost invariably the induration is most marked there. I maintain that this can only be done by an instrument which becomes practically a long knife in the operator's hand, and which is entirely under the control of that hand, subject to no mechanical restraint whatever, and cutting, much or little, when and where, just as the surgeon's tactile sense informs him is necessary. When making an accurate incision into any part immediately under the eye, or, for instance, in carving wood, we instinctively cut towards ourselves, or else from left to right, the hand thus being most appreciative, so in cutting a stricture I prefer to cut from

behind forwards, or from left to right, and the instrument which permits of this and at the same time is simply a knife and nothing more is the urethrotome usually credited to Civiale and always recommended and used by Sir Henry Thompson. The blade is protruded beyond the stricture and then drawn forwards, the stricture is divided, the blade is then sheathed, and the instrument is withdrawn. All kinds of mechanisms have been devised whereby a knife sliding in a grove is driven through the fibres of a stricture, but I can as readily conceive the tendo Achillis being properly divided by a similar mechanism as I can a urethral stricture. Imagine something being put under the tendo Achillis, and distended until the tendon is tightly stretched, and then a knife running in a groove on this machine, passed under the tendon—would any practical surgeon expect the tendon to be properly divided? If all tendons were mathematically of the same thickness and toughness, no doubt a blade could be devised that would divide them in this manner, but it is precisely because all tendons and all strictures are not of the same dimensions and densities that I would as strongly deprecate the use of a machine for a stricture as I would for a tendon. It is difficult for me to express in sufficiently moderate words my disapproval of such an instrument as Maisonneuve's, which still figures in our text-books and may be taken as the type of instrument preferred by those who would make surgery anything but what it ought to be—namely, a handicraft. The chromograph can never equal the painting done by the hand, or the music of the barrel-organ that of the piano. Before, however, a Civiale's urethrotome can be introduced, the stricture must be dilated up to at least No. 6 English, and I have found in practice that it is always possible after having passed a No. 1 to do so; indeed, I can only recall one case where this was difficult. It is, however, "le premier pas qui coute," and this leads me to the question of the treatment of difficult strictures, strictures which do not come to the surgeon until instrumentation is, if not apparently impossible, at least very difficult.

In ordinary practice if a patient in such a condition has complete retention of urine the aspirator will probably be used, and it may be used several times and still the stricture be found impassable by an instrument. Syme said, and I entirely agree with him, that puncture of the bladder for retention of urine is fully warranted in military, naval, and country practice; but "when hospital surgeons confess that they frequently find it necessary to puncture the bladder the standard of professional skill is lowered to a degree which may prove injurious to the

interests of the public." After aspiration of the bladder contents and continued failure to pass a catheter *per vias naturales* the modern surgeon will usually perform a perineal section, usually after Mr. Wheelhouse's method; by this operation he exposes the anterior face of the stricture by a free perineal incision and hopes to find the orifice of the stricture with his probe. If he finds the orifice a director is introduced, and the stricture is divided by a knife and a catheter is tied in. But the orifice of the stricture cannot always be found; the most consummate craftsmen have failed. My old friend Mr. Frederick Gant well remembers Professor Syme himself, during his brief surgical career in London, failing in this way in the operating theatre of University College Hospital after a protracted search. If the stricture orifice cannot be found the operator makes a hit-or-miss incision hoping to find the urethra behind the stricture. Is it surprising that incisions made in this way sometimes refuse to heal? Still, the advocates, from Syme downwards, of all the varieties of perineal incision are fond of laying stress upon their innocuousness. They all affirm that no surgical proceeding is safer or more harmless. I remember that distinguished surgeon, Mr. Walter Whitehead, saying at the Medical Society of London that with an experience of some hundreds of cases he had never known a case of severe hæmorrhage. Professor Syme, as we have seen, said the same, and apparently any difficulty in healing up the perineal incision is never met with. This is not, however, my experience. As my own cases of difficulty may perhaps be put down to my fault as an operator I will not refer to them, but will confine myself to what I have seen of the practice of others. I was much interested some years ago, when attending with Dr. Marmaduke Prickett a gentleman who some 40 years previously had undergone Syme's operation by Syme's own hands, to learn that our patient's chief and very sad recollection of the operation was that he had had to pay his Edinburgh landlady three pounds for the mattress which was ruined by the free bleeding. Professor James Syme was born in 1799 and he died in 1870. The first edition of his work on Stricture of the Urethra was published in 1849. There cannot, therefore, be many of his patients living now. I have been much interested in meeting professionally with two of them; both died as old men, and both were under my care for tight urethral stricture, showing that the vaunted permanent good results of Syme's external urethrotomy were not always justified by experience. I have several times been applied to to close a perineal fistula resulting from perineal

incision; and as illustrating the terrible infliction that a perineal urinary fistula is to a gentleman of refined habits I may mention that I once knew a patient so afflicted deliberately shoot himself rather than continue to be, as he imagined, an object of disgust to others. I had not operated originally, but I had made one attempt to close the fistula and had only partially succeeded and was about to operate again when the sad event occurred. This case made a great impression upon me, and with an experience of other cases of fistula taught me to dread all external urethral incisions, and has led me now never to make them except in rare cases of prostatic and urethral calculi, where such incision is absolutely necessary. I have, indeed, gradually become imbued with the belief that in cases of difficult stricture the perineum must on no account be interfered with. This has led me slowly to discover for myself *that there are no cases of stricture, however severe, through which it is impossible to pass an instrument.* This is going further than the dictum of Syme, who said that where water came out an instrument ought to go in. This teaching was not, however, original to Syme, I believe, but was taught by Chelius and probably by others older than he, as I am told by Dr. Daniel of Epsom, an old pupil of Chelius. In making this statement that all strictures are passable by instruments whether water comes through or not, I desire to speak with great care and deliberation, for I believe that the prevention and the mitigation of much human suffering depend upon belief in this doctrine. Of course I must exclude from consideration all cases where the urethra has ceased to exist, the result of mechanical or pathological injury, and I am aware that I am not in accord with many well-known authorities. For instance, Professor Samuel D. Gross, professor of surgery in the Jefferson Medical College of Philadelphia, wrote: "But I go further, and assert, upon the testimony of personal experience, that there is a class of strictures, the result of ordinary causes, which, while they admit of the flow of urine slowly and imperfectly it may be, do not permit the introduction of any instrument, however small, into the bladder." I cannot, however, accept this teaching and prefer that of the very appropriate lines of Herrick—

> "Attempt the end, and never stand to doubt;
> Nothing's so hard but search will find it out."

Believing that an instrument, with care and patience, can always be passed through a strictured urethra, I next assert that when once an instrument has been fairly passed into the

bladder it can boldly be withdrawn and replaced by one a size larger if the surgeon have confidence in himself; and finally, I have never yet met with a stricture which in this way could not be dilated up to No. 6 or No. 7 English. A Civiale's urethrotome can then be introduced and the stricture be divided. This is what I term my method of internal urethrotomy *tout d'un coup*, at one operation. The worst case of stricture may be anæsthetised, dilated up to No. 6, the urethrotome introduced, and the stricture cut to full size and left with a full-sized catheter tied in all at one sitting. I have. indeed, applied to internal urethrotomy the principle that Bigelow applied to stone—no two bites at a cherry: "If it were done, when 'tis done, then 'twere well 'twere done quickly."

Let us now consider the exact manipulation, we will not say of an impassable stricture, but of a very difficult one. In dealing with a difficult case of stricture I have long ago given up the use of filiform bougies; their use is not true surgery; it is simply blind groping and trusting to good fortune, whereas the surgeon should rely upon himself—that is, upon his sense of touch. Filiform bougies are really dangerous. When actually in the bladder they may break and lead to very unpleasant consequences. I once discovered one in the bladder of a patient after I had performed my operation of internal urethrotomy. The bougie had been there for months, having been broken off during an unsuccessful operation and left, and it had caused such great suffering that, never dreaming of what was there, I operated expecting to find a stone or some malignant growth. Filiform bougies are misleading also; no one can be sure where they really are, they may double up and really penetrate no distance, or they may pass into fistulæ or false passages. I regret to find that they are still recommended in the latest works on surgery. I once witnessed an amusing occurrence in a crowded hospital theatre. A bad stricture case was put upon the table. The surgeon was anxious to demonstrate to the students the efficacy of a bougie exactly two feet long, filiform for several inches at one end, and gradually thickening to a full-sized bougie at the other end. The filiform end was carefully passed inch by inch into the penis and there was not a hitch or difficulty of any sort. It really did appear as if the treatment of one of the most difficult of surgical diseases had been reduced to the greatest simplicity when suddenly the patient started and said that something was tickling his back, a hurried and anxious examination was made, and the bougie was discovered to have left the urethra

by a perineal fistula and to have travelled some way up between the patient's shirt and body.

In the passage and dilatation of really difficult strictures I have no confidence in any instruments except steel ones. No silver catheters are strong enough, and I have even given up using the probe-pointed silver catheter of Syme, which for a long time was a favourite of mine. I prefer finely-polished rigid steel instruments which will not bend or yield under any proper force and therefore allow of the most exact and accurate manipulation. I employ a set of 16 sounds; each one is two sizes larger in the shaft than at the point, the smallest being No. 2 in the shaft and less than No. 1 at the point (marked 0-2), the next being 3 in the shaft and 1 at the point (marked 1-3), and so on up to the largest, No. 17 (marked 15-17).

The treatment which I have devised for all cases of difficulty or so-called impassable stricture is as follows, and I would first of all advise that the surgeon should arrange for a convenient time, when he is as free as possible from harassing calls and messages. It is no use—indeed, it is dangerous—to attempt a bad case of stricture in a hurry. The instruments required are the sounds just mentioned, a Civiale's urethrotome (I always carry two in case of breakdown), some blunt-ended English gum bougies, varying in size from No. 3 to No. 10, a foot rule marked in inches, and a No. 11 or No. 12 soft gum catheter mounted on a stylet for tying in at the close of the operation. The patient (except in a case of acute retention) has been carefully prepared, aperients have been administered, a bath has been taken, and the rectum has been cleared by a good enema. If an operating table be not available the bed should be made firm and level by placing the leaf of a table or a board under the mattress. Each leg of the patient is wrapt up in a blanket and a third blanket is placed across the body; the perineum and pubes are thus left exposed. The patient is then completely anæsthetised for the urethral reflexes are the last to be anæsthetically abolished, and success depends upon the patient being perfectly quiet. A blunt-ended soft bougie is now introduced into the urethra, and the exact distance of the stricture, or in cases of multiple stricture of the anterior stricture, from the external meatus is accurately ascertained and measured. In very difficult cases the right-handed surgeon will have to stand on his patient's left, and, with his left finger in the rectum, he will steady and secure the point of the well-warmed and vaselined steel sound as, holding it in his right hand, he attempts to pass it. The finger in the rectum will

be at once informed if the point of the instrument leaves the middle line. No force must be used, but a steady search must be made for the orifice of the stricture and firm but gentle pressure exerted when it is found. The surgeon "must steal in little by little," as Ambroise Paré says, referring to another subject. The operator will find after a while that the stricture yields under his hand, the instrument advances a little, and soon he is gratified by feeling the end of the sound fairly grasped by the stricture. At this moment no attempt should be made to pass the instrument, which is probably the 1-3 or next to the smallest, on into the bladder, at any rate not unless it passes forward quite easily, but it should be withdrawn and the next largest one, the 2-4, applied, and then the 3-5 ; by so doing the orifice of the stricture will be dilated and will not grip and retain the point of the 1-3, which may be taken up again and will now probably pass on into the bladder. Then the 2-4, the 3-5, and the 4-6 should be successively passed in. The sounds are known to be in the bladder by their shafts being felt to be accurately in the middle line and their points free in the bladder. When once the No. 6 or No. 7 sound has been fairly passed into the bladder it should be allowed to remain in place while the surgeon changes sides. He now stands on his patient's right, draws out the sound and slips in the urethrotome. If difficulty be found in introducing the urethrotome the sound must again be passed. Sometimes the urethrotome can best be lightly and gently shaken in, as it were, rather than actually directed and passed in. When the bulb of the urethrotome is fairly in the bladder there is a sensation of looseness and freedom quite characteristic, and the surgeon may feel sure that all is right. Nothing should be attempted until the surgeon is satisfied that the urethrotome is really in the bladder. When in proper position the instrument is carefully withdrawn until the bulb is an inch beyond where the stricture is known to begin, the anæsthetist is warned that the patient must be perfectly still for a moment, the blade is then protruded and a free incision is made from behind forwards for a good inch along the floor of the urethra, and about half an inch deep. The blade is then sheathed and the instrument is withdrawn. A full-sized sound is now passed, a No. 12 or No. 13, and if, as is practically always the case, it passes easily, then the larger ones, Nos. 14, 15, 16, and 17 may be passed in succession, and then the soft catheter mounted on a stylet, curved so as exactly to correspond with the curve of the sounds, is passed

in, the stylet is removed, and the catheter is tied in. The urine which is in the bladder will issue by the catheter and so show that all is right. Should there be a doubt about the catheter being in the bladder it should be withdrawn and again passed in, and on no account should any water be injected through it until there is no doubt that it is in the bladder. When the catheter, usually a No. 10 or No. 11 (English scale), is secured in the bladder the operation is over. Usually the inlying catheter is well borne, and is removed in three days; in a very few cases there is irritation set up and the instrument has to be removed. I always do all that I can to persuade the patient to bear with the catheter for at least two days, as I am convinced that by its use the chances of hæmorrhage are much reduced and the pain and sometimes the difficulty of natural micturition are avoided. The patient sits up about the eighth day, and with the periodical passage of two or three well-warmed and well-oiled steel sounds—the largest, usually No. 14 (English)—the case is finished. The patient learns to pass these sounds for himself. By this method of mine the patient is not subjected before operation to painful, difficult, and often tedious instrumentation, and he is spared the old plan of dilating up the stricture by tying in a series of small catheters, each larger than the one preceding, which is certainly not the best preparation for a part which it is intended finally to incise, and above all the patient is spared a perineal incision, with all the slow recovery which necessarily follows such an operation. There is rarely any important hæmorrhage, and there is no risk of the possibility, by no means to be overlooked, of one of the most trying and disagreeable misfortunes—namely, a perineal urinary fistula. I have now had an experience of the operation of internal urethrotomy for 27 years, and I am happy to say that I have never lost a patient from it. I have only two or three times had any trouble from extravasation of urine, and when this has occurred it has always resulted from an incision in the anterior portion of the urethra, where the extravasation has been easily and safely dealt with.

The avoidance of preliminary instrumentation is important, for it is the disturbance of a difficult stricture by small instruments when the patient is not anæsthetised that is so often followed by urinary fever. The operation at one sitting is usually followed by no constitutional disturbance whatever. Internal urethrotomy at one operation, indeed, compares very favourably with operations by perineal section, and I would urge that even for the surgeon himself it is really a simpler operation. If a fine probe can be passed through the stricture

by looking, surely it can be passed through by feeling, so what is gained by the dangerous incision of the urethra from the perineum? In urinary surgery nearly all our work has to be done by the sense of touch rather than by sight. The great thing before attempting a difficult task is to believe that it can be done. If surgeons will only believe that all strictures are passable, they will be prepared to attack them with more patience—and patience and common surgical sense are all that are required—and we shall have fewer of those distressing and often hopeless cases where permanent fistula follows perineal section. I therefore recommend and assert that it can be done—that in all cases where in the consulting-room a stricture is found to be impassable, or if, for the reasons which I am about to name in detail, internal urethrotomy has been deemed advisable, whether the stricture is easily traversed or traversed with difficulty, the stricture be dilated by a series of conical steel sounds, while the patient is thoroughly anæsthetised, up to No. 6 of the English scale and not beyond No. 8, that the urethrotome be introduced and the stricture cut in the floor of the urethra. A large sound, varying from No. 14 to No. 17, can then be passed and the patient may be left with a soft gum catheter tied in for two or three days. Internal urethrotomy is an excellent operation, as I have just suggested, in many cases where there is no real difficulty in traversing the stricture with an instrument. These cases may be grouped as follows under eight heads. 1. When time is an object. The patient is perhaps ordered on foreign service, or perhaps, on the eve of marriage, finds that he is the subject of stricture. The instances might easily be multiplied where it is justifiable to run a little more risk than ordinary dilatation entails in order to get the best and most permanent results possible in the shortest space of time. 2. When the stricture is at the urethral orifice or in the penile urethra it will not permanently yield to either continuous or interrupted dilatation, but must be divided. 3. In cases of stricture where the gentlest instrumental interference is followed by rigor and great prostration. If the fibres of the stricture are freely divided the use of a bougie will cease to be followed by rigor. If after internal urethrotomy the use of a bougie is still followed by rigor it will be because the operation has been incomplete, and it must be repeated more thoroughly. Men are often met with from malarious countries who continue to have agueish attacks when resident again at home. I have not infrequently found this fever to be associated with urethral stricture, and have found that the attacks disappear altogether when the stricture is

divided. 4. Internal urethrotomy is required when a stricture rapidly re-contracts after dilatation. Such strictures are called "resilient." 5. Also when the deposit round a stricture is obviously large and dense, dilatation is useless, and the stricture must be cut, and sometimes requires more than one cutting operation before a satisfactory result is obtained. 6. When renal or other calculus is impacted behind a stricture the stricture had better be divided internally, and, if possible, the calculus extracted *per vias naturales;* should this prove impossible, the calculus may be cut down upon and the division of the stricture and subsequent treatment will prevent the opening made from becoming fistulous. 7. No urethral fistula will ever heal as long as the urethra is contracted in front of the fistulous urethral orifice. Divide the stricture and keep it open by periodical instrumentation and usually the fistula will close. 8. As age advances it is not unusual, although the contrary has been stated, for the troubles of a patient suffering from stricture to be complicated by prostatic hypertrophy, making it necessary for him to pass a part of, or the whole, of his urine by catheter. To do so he must have a patent and easy urethra, and as stricture tends to tighten up in elderly people many of these patients find increasing difficulty in passing a catheter of reasonable size. Here internal urethrotomy comes to our aid, for the stricture is too hard and inelastic to yield to dilatation.

I will briefly relate one typical case of treatment of difficult stricture showing what can be done by internal urethotomy at one sitting. The patient was a man, aged 40 years. He began to have stricture trouble 15 years ago. Eight years before I saw him he was operated upon for perineal abscess and extravasation of urine, but no instrument could be passed into the bladder and not one had since been passed. No urine had issued since from the penis. He had to sit down and he passed urine through four perineal openings. A seminal discharge came through the fistulæ with great pain. Being employed on a sugar plantation he wore a kilt and put up with this misery for eight years. He rested a little after his voyage to England and was then well anæsthetised. At five inches from the external meatus my instruments at first were all arrested. The sitting occupied one and a half hours. I succeeded in passing my smallest steel sound and then ran up to the 6½, put in the urethrotome, divided the stricture and passed a No. 13 steel sound and tied in a No. 12 catheter. This catheter was retained for six days; two days after this he learned to pass a catheter, and soon he was able to draw all his urine by that instrument. In 14 days his fistulæ were dry

and in a month all was so well healed that he was allowed to pass urine naturally. He had been in bed only two weeks, and in three weeks from the operation was about much as usual. He returned home quite well.

Much as I dislike incising the perineum there are four conditions where it has to be done: (1) when there is extravasation of urine; (2) when pus requires an exit; (3) in some cases of prostatic calculi; and (4) in certain rare cases of urethral calculus. In the two latter instances and in one form of prostatic abscess the urethra must be incised as well. In all cases of periprostatic abscess and of perineal abscess a free perineal incision must be made at once. The mischief which may result from delay is astonishing. In prostatic abscess I have known pus burrow into the buttocks and even into the groins, presenting there like a bubo, before incision has been made, and of course the abscess may open into the rectum, causing a rectal urinary fistula which may need months of careful treatment and may even embitter the whole of the remaining lifetime. The ordinary prostatic abscess should be opened from the perineum, but the urethra, in my judgment, should be severely left alone. There is, however, one form of prostatic abscess which I have not seen described and which needs special treatment. Two forms of prostatic abscess are usually mentioned—the periprostatic abscess and the follicular abscess. But I have occasionally been consulted by elderly men exhausted by a profuse and continuous discharge of pus from the ueethra, and upon rectal examination I have found one or other prostatic lobe simply a bag of pus draining imperfectly and slowly into the urethra. There has been no periprostatic collection of pus. It is unwise to attempt to go straight into this prostatic bag of pus from the perineum for obvious reasons. I have had great success by opening the urethra behind the bulb from the perineum. I then pass the forefinger of the left hand gently into the prostatic urethra, along this finger I pass a probe-pointed director, and guided by the end of the forefinger, the probe is made to pierce the wall of the prostatic urethra from the urethra. Then a pair of polypus forceps is passed in and opened so as to dilate the wound in the prostatic urethral wall. I have found that, so treated, the abscess drains freely and recovery takes place in cases which under other treatment do not do well.

Then with reference to perineal abscess, a patient afflicted with a tight stricture sometimes without any very definite cause finds himself unwell. His perineum is hard, tender, and throbbing, and he may or may not have a rigor. We all

know that a perineal abscess is in process of formation. All surgeons open such an abscess at once, giving vent usually to a large quantity of matter; in a few days urine is passed by the wound, and unless the stricture is attended to a permanent urethral fistula remains; often the stricture is leisurely attended to by dilatation, and even then the fistula is generally obstinate and a source of annoyance to the patient for years. Some surgeons are more heroic (for example, the late Dr. Van Buren of New York); they open the abscess and then divide the stricture from the outside upon a grooved staff, thus performing a Syme's operation and remedying the abscess and the stricture at the same time. The result is generally satisfactory, but all will allow that such an operation is a very serious tax upon a patient's powers and that he must remain a patient, and far from comfortable, for some four, five, or six weeks. Such an abscess as just described is not an extravasation abscess; at first it does not communicate with the urethra although it does so in a few days; it forms in the perineum outside the urethra, as Sir Henry Thompson has pointed out, just as an abscess may form by the side of the rectum without opening into it. A real extravasation abscess is not so very common; it begins by minute extravasation behind th stricture, but the formation is tedious and is preceded by a slow growing cord like process which is unmistakable to the touch of the practical surgeon. Now my point is this: if the surgeon is prompt in dividing the urethral stricture a true perineal abscess never will communicate with the urethra and the patient will be saved all the trouble of a urinary fistula. I freely divide the stricture from inside the urethra, pass a No. 15 or No. 16 (English) steel sound, and tie into the bladder a No. 12 gum catheter per penem. I then put the patient into the lateral lithotomy position and, with my left forefinger in the bowel, I introduce a sharp narrow knife into the perineum half an inch above the anus. I go straight in until pus issues and then withdraw, and in withdrawing divide the skin upwards a little so that the finger can follow the knife; the finger dilates the opening and finds a large cavity full of pus with the urethra filled by the catheter lying above, almost, as it were, dissected away from the surrounding tissues. As a rule this one opening will suffice to drain the abscess, but I have had to make a more dependent opening in the buttock. The catheter should remain in about three days. Patients treated in this way, I find, make easy and rapid recoveries.

In concluding this lecture on the urethra I would submit that while it is very easy to cut into a urethra it is sometimes

very difficult to heal up the incision and that a urethro-perineal fistula is a lamentable complaint. The urethra should never be opened in any case of vesical calculus, urethral stricture, perineal abscess and extravasation, or for vesical exploration or drainage, or for any prostatic operation. I look upon urethral incision in these cases as a surgical mistake.

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