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Contributors

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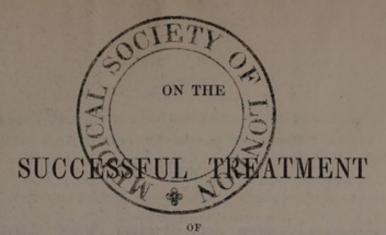
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STRICTURES OF THE URETHRA,

SUPPOSED TO BE INTRACTABLE:

A Lecture

DELIVERED BEFORE THE MEDICAL SOCIETY OF LONDON, IN APRIL, 1851,

BY

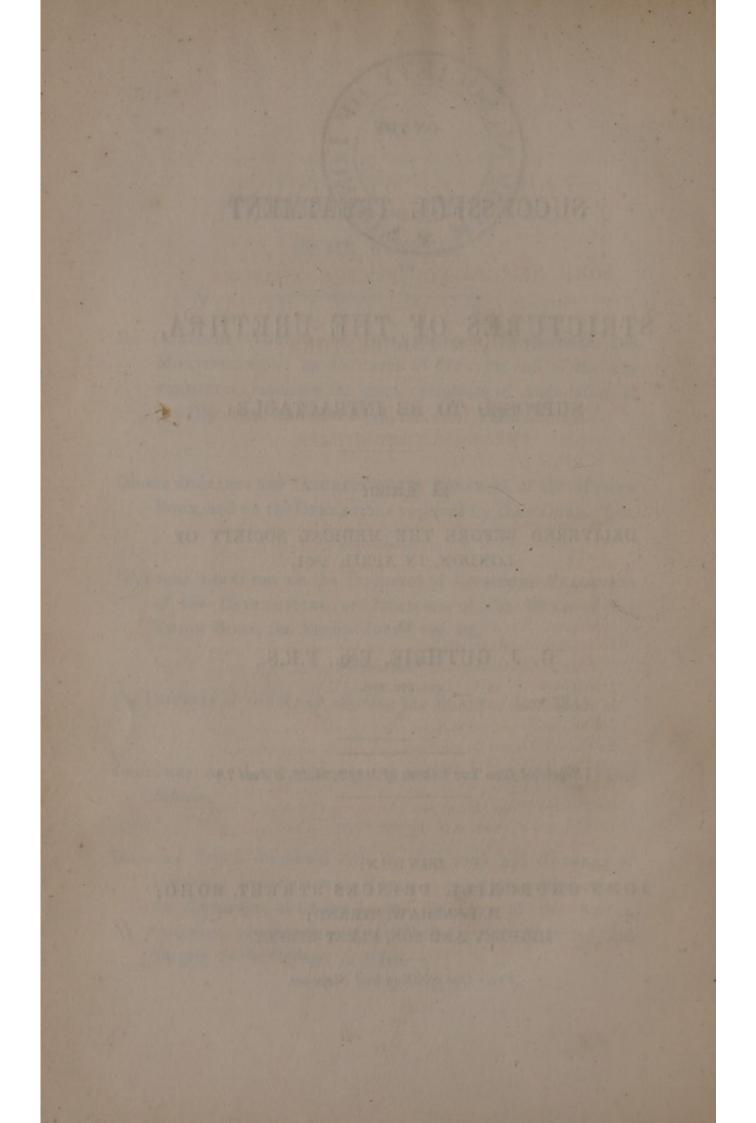
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ON THE TREATMENT OF IRRITABLE AND IMPASSABLE STRICTURES.

MR. PRESIDENT,—I have selected for the subject of this my third lecture one of the most important points in anatomy and surgery—important from the investigations lately made in anatomy, which I shall bring before you, and from the facts to which I have to claim your attention in an especial manner in surgery. It is not my intention to enter into any perfectly acknowledged points in anatomy, or any controversial ones in surgery; but to renew and establish, if possible, those great principles which ought to guide surgeons in the present day in the treatment of irritable and intractable strictures of the urethra; and which perhaps the great opportunities I have had for observation may, in some measure, entitle me to attempt.

When Professor of anatomy and surgery to the Royal College of Surgeons of England in 1830, I demonstrated, in the lectures I then gave on the Anatomy and Diseases of the Bladder and Urethra, that the outer layer of the muscular coat of the bladder, or its longitudinal fibres, did not terminate at the neck of the bladder, as was then taught, and as it is even now very generally stated to do by those who have not minutely attended to this subject; but were inserted behind into a tendinous line, attached to but short of the posterior part of the base of the prostate, immediately beneath the

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uvula of the bladder; from which spot a strong band of fibres was often continued on, not only into the prostate gland, but as far forwards as the verumontanum. This fact Mr. Adams, in the article "Prostate" in Dr. Todd's "Cyclopædia of Anatomy and Physiology," has from inadvertence attributed to my friend Mr. Harrison, by whom it has also been described in the article "Bladder." It belongs, however, to my old pupil and friend, Mr. Hancock, now surgeon to the Charing-cross Hospital, and myself since 1830. He has lately perceived under the microscope, that these fibres are even continued on the under surface of the gland to the urethra, and has further shown that these minute fibres, which are in all instances apparent under the microscope, not only enter largely into the composition of the prostate, but surround the orifices of the ejaculatory, and all the various ducts opening into this as well as all other parts of the urethra; being with all the muscular fibres of the bladder, of the involuntary or nucleated kind, in opposition to those of the voluntary species, which are striated or striped. On the anterior part, the longitudinal fibres descending from the bladder cover and lie upon the sides of the prostate, into which they are inserted, as well as into one or more tendons, usually two, formed on the upper part, which although they are often called ligaments, ought to be regarded as the proper tendons of the bladder, and are inserted into the pubes near the symphysis. When these muscular fibres contract, which they do independently of the will of the individual, they diminish the length of the bladder, compress it against the pubes, and thus aid in expelling the urine. If the attachment which the pelvic fascia descending from the pubes has to them be dissected off, some fibres will be seen passing backwards in a radiated form to the fore part and sides of the prostate; being the fibres mentioned by Winslow, Blandin, and other anatomists, as having been seen, but not shown in their engravings of these parts; any more than those longitudinal ones which I have described as passing from the bladder, and compressing the sides of the prostate in a more decided manner than has been usually suspected.

The internal layers of the muscular fibres of the bladder are also involuntary or nucleated, like those of the stomach and intestines, their average diameter being $\frac{1}{2500}$ th of an inch.

They run in a transverse, spiral, and even oval direction, communicating frequently with each other near the cervix, so as to be in parts nearly inseparable. They are mostly found in bundles of various sizes, each having its system of minute capillary vessels exceedingly characteristic of muscular fibre, and are best seen from the inside of the bladder. When thickened, they project into its cavity, forming strong bands covered by the mucous coat, which is, in its natural state, of a pale-straw colour, to both of which I shall presently allude. These internal fibres have been hitherto supposed to terminate at the part where the bladder joins the urethra, both in the male and female. The microscope has however shown in the hands of Mr. Hancock and Mr. Hogg, who assisted him in all his investigations, and it is confirmed by Mr. Quekett, that they are continued in a layer, invisible to the naked eye, from the bladder, being separated from its mucous coat by the elastic areolar tissue, on to and along the urethra to its extremity; to which it thus gives a muscular covering. This in its passage to and around the membraneous part of the urethra, is united with the longitudinal layer lying underneath and forming a part of the prostate; thus giving when united, a muscular covering distinct from, and which may not be mistaken for the compressor muscle, the complete structure of which I first publicly demonstrated in my lectures in 1830, and which is of the voluntary or striated kind, a marked distinction existing between them.

On reaching that portion of the urethra, to which, at its under part, the bulb is attached—that is, after it passes through the deep fascia of the perinæum—this thin layer of muscular fibres divides—one portion continues on to the extremity of the urethra, lying between it and the corpus spongiosum, by which it is surrounded, some fibres extending into the papillæ on the surface of the mucous membrane. The other portion runs on, or lies upon the outer surface of the corpus spongiosum, separating it from its fibrous covering, to which it adheres very intimately, and is continued forward to the orifice of the urethra. In their course these fibres invest the spongy portion of the bulb, the urethra, and the glans penis, entering very largely into the formation of that peculiar structure found at the orifice of the urethra, constituting according to Mr. Hancock, an additional sphincter muscle to those already described as existing in various parts of the body. The arrangement of the fibres at this spot is well shown in a preparation made from a foctus of six months. It will thus be seen that the corpus spongiosum urethræ lies between two layers of involuntary muscle, the one separating it from the urethra, the other from its fibrous investment-an arrangement which also obtains in the glans, by which means the spongy texture, besides being largely supplied by nerves, lies between involuntary muscular fibres, even where it covers the extremities of the corpora cavernosa, and Mr. Quekett has traced them into the substance of the corpus spongiosum in the rhinoceros, the elephant, and the horse, as well as in man. This must doubtless exert great influence upon the expulsion of the blood from the spongy tissue when erection of the organ is no longer required, as well as upon the acceleration of the passage of the urine along the urethra, and the ejection of the last drops.

The contraction of the internal layer will enable us to account for the differences in the size of the urethra, which have at times been observed in disease, but which could not be well explained by elasticity of structure alone.

I have made many attempts to discover muscular fibres around the neck or opening of the bladder, which might act as a sphincter, but have not succeeded in showing any in so satisfactory a manner as would enable me to suppose that they effected this object. It may therefore be believed that the portion of the bladder surrounding the opening into the urethra possesses but little muscular contractility, whilst it is endowed with a singular degree of elasticity, that it retains for some time after death, which may be termed vital. This is easily demonstrated by stretching the part, the elasticity being dependent on the yellow elastic fibre shown by the microscope as entering into the structure of the bladder, and particularly of its cervix.

The muscular fibres of the bladder in the female follow the same course as in the male, and the microscopical researches of Messrs. Hancock and Hogg have shown that a similar arrangement of them takes place in the female urethra, on all points that its conformation will permit, and particularly in its course to, and at the orifice.

The neck of the bladder, as it is commonly termed, is a mere ring little broader than the thickness of the bladder itself. The abruptness with which the opening commences when viewed from within, appears to warrant the acceptation of the term, neck, on the under part of which the little eminence called the uvula is situated. When this part loses some of the elasticity with which it is endowed, and which like all other parts of the body it does with age, or from internal changes the consequence of disease; it becomes harder and contracted, constituting a stricture or firm contraction, resembling in many respects, that almost cartilaginous structure which often takes place in the urethra. I first pointed out this alteration, which had been previously considered as a complaint of the prostate gland, with which it is not connected, as well as the appropriate means of cure by operation. A great mistake had been previously committed, and indeed now continues, that an enlarged prostate is a very common disease of old men, and particularly of the part called its third lobe. In my lectures delivered in 1830, I declared this error to be one of those which still existed in modern surgery. The point, I am happy to say, has of late been closely investigated by the surgeons of the Royal Naval Hospital, Greenwich; and Sir John Liddell, Dr. Beith, and indeed all of them assure me, that on the examination of the bodies of most of the old men who die there,-and from two to three hundred or more die annually of old age,-the enlargement of the prostate, and especially of its third lobe, is not commonly found in them; thus confirming and indeed establishing the fact stated by me in 1830, whilst it adds to its value, by proving that the changes which do take place in these parts, often admit of more relief from art than they were formerly supposed to be capable of receiving.

If the bladder be cut across transversely at its lower part, a space will be seen behind, of a triangular form, evidently whiter in colour and of a more condensed structure; the apex of which is formed by the orifice of the bladder, whilst its base is marked by a strong whitishcoloured band, which passes transversely across from side to side. The ureters open near the two extremities of the band, the distance between them being about an inch and a quarter, the other two sides of the triangle being generally

of the same extent. Their orifices are surrounded by a peculiarly condensed and somewhat inelastic substance which lies beneath the mucous lining of the bladder, between it and the internal muscular coat, which substance appears to be continuous with the orifice of the bladder, and to constitute the elastic membrane of the urethra. The ureters enter obliquely, surrounded by the muscular fibres of the bladder; their orifices are small, always open, and are not easily dilated. I ventured to assert, in the lectures alluded to, that the opinions entertained upon the manner in which the functions of the ureters were performed were erroneous; that the muscular fibres surrounding the ureters were not intended to prevent the urine from flowing back from the bladder into them; but that this mechanism was intended to compress the ureter at its neck, just below its orifice, for the purpose of preventing more urine from flowing in and distending the bladder until it ruptured, or the urethra gave way, provided the exit of the urine from it were impeded in any part of its course.

The ureter opens on a condensed and somewhat inelastic structure, in order that the orifice may be constantly patulous; and the obliquity of its passage, through and between the muscular coats of the bladder, is for the purpose of giving facility to its being pressed upon and closed when the viscus is in a distended state, in order to delay, if not to prevent, the further flow of urine into it from the kidney. When the bladder is contracted, and empty, the urine passes readily into and gradually dilates it, until the desire for expulsion comes on, and leads to its evacuation. A little more or a little less seems to have no influence in preventing the urine from finding its way in, the weight of the column descending from the kidney readily overbalancing, to a certain point, the resisting power of the coats of the bladder. When the bladder is distended, it no longer yields easily, the ureter is pressed upon by the muscular wall in its passage through it, and the further entrance of urine is in a great measure prevented. If the obstruction be long continued, the ureter above this part is gradually dilated from the size of a crow-quill to that of a man's thumb, and even larger; the pelvis of the kidney increases in size, a low or chronic inflammation is induced, the secretory organs are pressed upon, and partially removed,

so that the kidney may become at last an almost empty bag, separated by partitions, indicating only the former existence of its lobes. A total suppression of the secretion may, under such circumstances, take place at any time. The most remarkable example of the kind which has come under my observation, occurred in the case of a lady who suffered from a cancer of the uterus; the disease, after a time, extended towards the ureters, which at last were embraced and pressed upon by it as they entered the bladder. The lady, as this took place, began to suffer more from derangement in her urinary apparatus; the bladder was found ultimately, on passing the catheter, to contain little or no water; she fell into a state of low fever, became paralytic, afterwards comatose, and died. On examination, the orifices of the ureters were found in a sound state, although the ureters were impervious at the part where they were grasped by the diseased structure; above this they were greatly enlarged, and the kidneys were much diseased and sacculated. The peculiar manner in which the ureters enter into the bladder is, then, an admirable provision of Nature for the purpose of preventing too great a distention of the bladder rather than of the ureters, for Nature can accommodate herself for several days to a complete suppression of the secretion of urine, and for a very long time to a partial secretion of it. The natural quantity usually secreted varies from two pints to two and a half in the twenty-four hours, and when an obstruction takes place in the urethra, preventing its evacuation, the bladder may become considerably distended; but the same quantity will not be secreted during the second twenty-four hours as in the first, and there will be still less during the third, before which time relief ought to be given by operative means, if it should not occur otherwise. This provision of Nature is therefore intended, I apprehend, to protect as far as possible the bladder and urethra, rather than the constitution of the patient; the bladder, or rather the urethra, being more susceptible of mischief in a shorter time than the system at large. The two bands on the triangular space, described erroneously by Sir C. Bell as being muscles of the ureters, are composed of white inelastic, but not muscular fibres, which keep the part fixed, and strengthen and help to raise it up when necessary.

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The triangular space is highly sensible, the nerves being directed to, and communicating more particularly on it, as they descend on each side, from the inferior mesenteric and the hypogastric plexus, and from the third and fourth sacral nerves. It is therefore very excitable, and when irritated, gives rise to the desire to evacuate the bladder, as well as sometimes to very great pain, as all have experienced who have suffered from stone in this viscus. The idea entertained by some surgeons, that a bougie touches this part on entering the bladder, and in this manner gives rise to the desire which is usually experienced to pass the urine, is certainly erroneous; for when a healthy bladder contains a moderate quantity of fluid, a bougie can only touch the very apex of this space on its entrance into the bladder; and observation has led me to believe that this desire takes place rather at an earlier period, when the instrument has entered that part of the urethra which is surrounded by the prostate. In a healthy state of the bladder, it enlarges considerably downwards towards the rectum when moderately distended, and the triangular space descends, rendering it nearly impossible for a bougie to touch more than the apex of the triangle, unless it be curved backwards at the extremity. The triangular space, or trigone, rests on the rectum, and the bladder is punctured through it when that operation is done, but which I do not recommend to your attention, believing that it ought to be superseded in almost every case by others, which will be noticed in their proper places. The operation of puncturing the bladder through the rectum was founded on the supposed anatomical fact, that the triangular space rested on and closely adhered to the rectum, so that the urine would flow directly from one part into the other, without escaping into the neighbouring structures. The peritonæum however, instead of passing down behind the bladder, and between it and the rectum to the base of the triangular space, and there terminating in a cul-de-sac, does sometimes pass on farther, between the triangular space and the rectum, and even occasionally as far forwards as the prostate gland; so that by puncturing through the rectum, the general cavity of the peritonæum will be opened in such cases before the bladder is penetrated, and the patient must be lost, from the urine finding its way into the peritonæal cavity; and giving rise to an inflammation which has always been destructive whenever this kind of effusion has taken place, and from whatever cause. I am not aware of there being any signs by which this conformation can or cannot be distinguished, and consequently the safety of the patient depends not on the knowledge and ability of the surgeon, but on the more usual formation of the part on which the operation is performed, being present.

The corresponding portion of the bladder, on its anterior part, is in a similar although more certain manner, devoid of peritonæum, and has been made the subject of an operation by puncture above the pubes. This operation is altogether objectionable, except in some few cases of enlarged prostate, and ought only to be performed when the bladder is manifestly distended, and an operation is absolutely required to give relief.

The anatomical fact of the anterior and lower part of the bladder being uncovered by peritonæum when the organ is much distended and elevated in the abdomen, has lately been doubted; and it is supposed that the bladder can only be punctured by a trocar which has twice passed through the peritonæum, thereby opening the cavity of the abdomen, and in all probability destroying the patient. This would be the case, provided the bladder were so thickened that it could not be dilated by the influx of water into it; but as this does not usually occur, and the bladder does become distended, the operation for the time succeeds, and the anatomical doubt may be considered an error under such circumstances.

When the elastic structure at the neck does not yield to the pressure usually exercised by the muscular coats of the bladder, in consequence of its being the seat of commencing disease, the transverse and longitudinal fibres are called upon to act with a greater degree of vigour, and in certain cases during this augmented action, the mucous coat becomes distended by the urine, yields, and protrudes externally between these muscular fibres. The commencement of a vesical pouch is thus formed, which goes on increasing, if the same causes continue which gave rise to it, until it attains considerable magnitude. The opening between the muscular fibres by which it began, is usually of a small size, leading to a large cavity, into which a stone may pass, and be fortunately shut up so as to give rise to no farther inconvenience, and to the belief that the stone has been dissolved or passed. In other instances, the opening may be so large and in such a situation as to admit of the stone being struck by the point of the sound, although it will not be readily discovered or extracted after the operation for its removal has been accomplished. In all cases a quantity of urine may and will be received in these pouches, and various secretions may be poured into, and retained in them. If the bladder be emptied by the catheter in the erect position, and the patient be made to change it by lying down, retaining the catheter in its place, an additional quantity may run from the instrument, showing that one or other of these pouches has been emptied.

In such cases a smart blow is often felt on the instrument, coeval with the termination of the flow of urine. Sometimes the stroke is repeated twice, or even three times. The blow thus given will sometimes force the catheter, when slightly held, from between the finger and thumb, at least two inches out of the urethra. It is, however, deficient in the sound which a solid, hard substance gives, the tick as it is often called technically, and leads to the conclusion that it must occur from a pouch falling against the instrument, and in which pouch there may or may not be a stone. Sometimes the blows on the catheter resemble more the blows given by the wings of a bird in fluttering, so that I have been in the habit of calling them the *fluttering strokes of the bladder*, believing that they depend on some unusual or irregular action of or near the base of the triangular space. The blows resemble that from a solid substance, although the grate which a stone gives, or ought to give, to either a silver, a steel, or a gum-elastic catheter, is wanting, and is never felt except when the last drops of urine are flowing, so that the patients themselves frequently observe it, and ask the cause.

The actual length of the urethra is a matter of little importance, being dependent very much on its pendulous part in the male, and on the size of the individual pelvis, some urethræ measuring after death eleven inches, others only seven or eight, although in a state of health a catheter seven inches in length will usually empty the bladder. A surgeon should never calculate by inches in passing an instrument, but by the prin-

cipal points of attachment, which may be considered as so many beacons or landmarks to guide him in its passage. The only mistake of importance is frequently made with respect to that portion of the urethra which is within the external layer of the deep fascia of the perinæum, and which includes the membranous and prostatic parts, the former being commonly six or eight lines, or about half an inch long, the latter, perhaps about an inch during life, although, when removed from the body, they can be elongated to a greater extent. Sir E. Home estimated the length of the prostatic portion at half an inch; the membranous part at an inch and a half. Camper and Portal gave an inch and a half to the prostatic part, and an inch to the membranous. Petrequin, Lisfranc, and the latest French anatomists, reckon the prostatic portion as differing from about half an inch to three quarters, or from eight to eleven lines, in different persons. The late Mr. Briggs, who took some pains to obtain a correct estimate, allowed an inch and three quarters for both. M. Malgaigne admits thirteen lines, or a little more than an inch. Mr. Adams, in the article Urethra, in Dr. Todd's "Cyclopædia;" gives from twelve to fifteen lines to the prostatic part alone. Silver or elastic catheters for common use need never be more than ten inches long. When the prostate is enlarged, they may be twelve, and every surgeon should have a silver one of fourteen. Long catheters for ordinary purposes are principally useful to the makers by increasing the cost of them, but not otherwise.

The diameter of the urethra is as uncertain as the length, varying in different individuals from three to five lines, or even from a quarter to nearly half an inch. The orifice is the smallest part, except in a few rare instances, when it is about a quarter of an inch within it and in sight. The orifice is also the least capable of extension, although every other part may be stretched considerably. A permanent contraction therefore, in any part of the canal, can rarely be effectually cured by dilatation unless the orifice is enlarged, which can only be done by its being divided—a fact now well known to all persons of character and experience, but which from prudential reasons is not always distinctly stated in books. In a sound state of parts, the urethra continues of a size at least as large as that of the orifice and will from its elasticity admit an instrument with ease which is larger; until it reaches the part where it begins to be surrounded by the bulb of the corpus spongiosum, and therefore called the bulbous portion of the urethra. This part of the urethra, although not very perceptibly larger in the natural state when examined after death, does admit of much more extension than any other portion when a cast is taken of the whole urethra by distending it with pressure by a fusible metal. The accompanying diagram shows this in a remarkable manner.

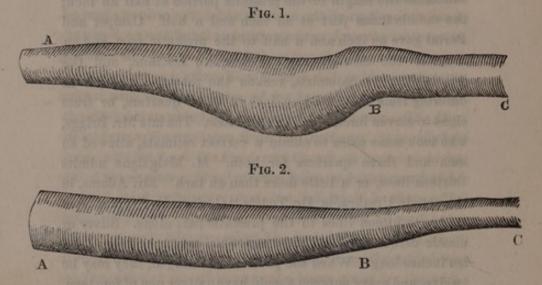


Fig. 1 is a cast made by Mr. Quekett in situ, with some distention. A is the anterior part of the urethra gradually dilating into the bulbous portion, which terminates and is again contracted at B, in a more sudden and marked manner, being the part where the urethra is surrounded by the anterior layer of the deep perinæal fascia, formerly called the triangular ligament of Camper. When a urethra is removed with the parts around it from the body, and slit open on its upper part, neither the bulging nor contraction are very observable. If the urethra be stretched whilst the points of attachment of the fascia or triangular ligament are held steadily on each side, the ridge the fascia forms under it may be distinctly felt and seen. I object to the term triangular ligament as applicable to the part underneath the urethra, because it is found with some difficulty on dissecting the parts; and leaves on the mind of the student an unfounded impression of its nature, although the form, separations, and attachments of the fascize at this part constitute the most difficult part of knowledge to acquire, give the most trouble, and are the most important in the treatment of diseases of the urethra. It is at this spot at which the worst strictures exist, at which false passages are usually made, and which the dilatable state of the bulbous portion of the urethra in front of the resisting fascia greatly favours. The diagram shows this part well: at C it marks the entrance into the bladder, whilst it also shows that the distance from B to C, or the extent of the membranous part of the urethra, and of the prostatic portion, is not near as much in the natural state of parts, when they are held compactly together, as when they are removed and stretched out for measurement. Fig. 2 (also made by Mr. Quekett) shows a similar portion of the urethra simply filled with the same metal, but without being distended. The development of the bulbous portion, or gulph as it was called by the ancient anatomists, is not so marked as in Fig. 1, and the length of the membranous and prostatic portions is greater. The differences of length estimated by different surgeons for these parts may perhaps be thus accounted for.

The urethra obtains its full development at and after the age of puberty, previously to which it is more uniform in its dimensions, being nearly free from the inequalities which have been noticed. It assumes at this time a somewhat different form as to its curvature, particularly at the posterior or prostatic part, which rises in the child much more perpendicularly into the pelvis than in the adult, and is comparatively longer, the bladder being situated higher, and more elevated towards the abdomen, requiring, as has been long well known, a greater turn for the end of the staff in operating for lithotomy in the child, when a curved instrument is made use of.

The membranous part of the urethra is surrounded, not only by the sheath of *involuntary* muscular fibres just noticed, but by the *voluntary* muscle, first fully described in my lectures in 1830, which is a sphincter, closing when in action the urethra, and preventing the passage of urine from the bladder. The muscle may be sought for from within, which is perhaps the best way, by carefully dissecting off and turning aside the inner layer of the deep perinæal fascia with the levator ani muscle, of which it was supposed by Mr. Wilson to form a part, but which is a totally distinct muscle, having no connexion with it. The pudic artery runs in front of it, but internal to the external layer of fascia, the muscle and the artery both lying between its anterior and posterior layers, which posterior layer turns round the inner edge of the levator ani muscle, to invest the urethra and prostate. On the upper part there is a median line of tendon attached to the pubes by fascia, one half of which runs backwards with the muscle, to be inserted into the upper surface of the prostate; the other half passes forwards on the urethra, through the triangular ligament, to be inserted in front of it, near the union of the corpora cavernosa. On the under part there is a similar tendinous line, which is attached posteriorly to the fascia underneath the apex of the prostate, and forwards to the central tendinous point in the perinæum. The muscle on its upper surface is covered by fascia descending from the pubes. From the median tendinous line, in the upper part of the urethra, the fibres pass outwards on each side, converging, as they proceed, so as to form a leg of muscular fibres. On the under surface the same thing takes place; and a leg on each side being thus formed from the superior and inferior fibres running from above and below the urethra, they unite and pass outwardly, that is, transversely across the perinæum, to be inserted into the ischium, near or about its junction with the descending ramus of the pubis on each side.

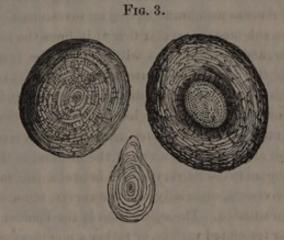
I have noticed this part of anatomy more than I should otherwise have done, because I have seen, in the latest publications on this point, that some mistakes are yet made. It is supposed that the late Mr. Wilson, my old teacher of anatomy and friend, and I, have each described a muscle, and that there are consequently two different muscles, which is an error. Mr. Wilson described the same muscle but imperfectly, from having always dissected the parts laterally—that is, by making a side view of them; and he concluded that it was a detached portion of the levator ani; but this is an error, one muscle being anterior, the other posterior to the internal layer of the deep fascia which is between them; but fasciæ in his day were not so much attended to as at present. There are not two Mr. Quekett, on making recently a careful examination of this part, has found that some considerable portion of this muscle is continued on to the anterior part of the prostate, and is intimately blended with its tissue; the transverse striæ, characteristic of voluntary muscle, being very readily recognised in this position. A muscle, termed *levator prostatæ* by Santorini, and also by Ellis, has its origin at the posterior surface of the symphysis pubis, and is continued backwards, to be inserted into the upper portion of the fascia of the prostate; this muscle, however, when present, is distinct from that above described.

It is not generally known, even if it be generally taught, that a tendinous part of the accelerator urinæ muscle surrounds the urethra at the commencement of its bulbous portion; and there is sometimes here a slight narrowing of the canal, when compared with its anterior part, previously to the formation of the more dilatable portion or bulb; and at this part a stricture is often found to take place. This conformation would lead to the supposition that the accelerator urinæ is also a sphincter; and Mr. Hancock believes that it is certainly a depressor, opposed to the erectile forces of the general structure of the parts. The accelerator urinæ and the compressor urethræ I have described have a singular resemblance to each other, which can, however, be only seen when they are carefully and fully dissected, which I apprehend is a performance not too frequently had recourse to, judging from the descriptions I occasionally hear of these parts.

The intimate structure of the *prostate* gland has been investigated by many anatomists even of modern times, such as Müller, Weber, Henle, Jones, and Adams; and again, more lately, by Mr. Quekett and Mr. Hancock, under the microscope. Mr. Hancock finds that the bands of the prostate noticed by Dr. Jones as resembling involuntary muscular fibres, are in reality composed of such fibres, proceeding from and continuous with those of the inner layer of the bladder, the nuclei being larger in proportion to the fibres in the young than in the old, from the prevalence of phosphatic deposit and fatty degeneration; and this defective state of muscular development may,

Mr. Hancock thinks, in some degree, account for the incontinence of urine to which elderly persons are subjected. Mr. Quekett considers the secreting portion of this gland to consist of a series of minute follicles, aggregated together and communicating with an excretory duct; these are firmly enclosed by a dense fibrous capsule, derived from the vesical fascia, which is divisible into two layers, between which the prostatic plexus of veins runs. When a vertical section of the prostate is made, especially if the gland have been injected, the follicles may be seen in outline, and an opaque brownish fluid may be squeezed out of them; but if one of the ducts be injected, their shape is more clearly shown; they are generally of a more or less oval figure, and in a healthy gland may be said to measure, on an average, 100 th of an inch in diameter. The interior of the follicles is lined with spheroidal or glandular epithelium, that of the ducts being a modification of the tesselated and columnar. In a well developed gland there are as many as fifteen or twenty ducts, all of which open into the urethra, in the neighbourhood of the verumontanum. The greater portion of the tissue filling up the spaces between the follicles is composed of the areolar kind, containing a large amount of involuntary muscular fibres, to which, according to Dr.C.H. Jones, the hypertrophied condition of the gland is due, rather than to the phosphatic deposit and fatty degeneration of Mr. Hancock.

In aged persons both the glandular structure and the intermediate tissues are frequently much enlarged; the follicles in persons of all ages, from childhood upwards, contain calculi composed principally of phosphate mixed with a small amount of carbonate of lime. They are of a yellow colour and their presence so constant that they would seem to be a part of the natural secretion of the gland. The deposition of the earthy material commences in the secreting cells of the gland, and the calculi increase in size both by the aggregation of fresh cells and by deposit in concentric laminæ. In the former case they mould themselves to the form of the follicles, and in the latter they exhibit a concentric arrangement. When dilute hydrochloric acid is added to them the earthy matter disappears, and a cast of the original calculus remains in animal matter. A few of the minute calculi are shown in fig. 3, under a magnifying power of $\frac{1}{250}$ diameters; these specimens vary in size from the $\frac{1}{200}$ th to the $\frac{1}{100}$ th of an inch, they occur from this small size to large oval masses three inches in circumference; their most common diameter, however, is about the size of a grain of mustard.

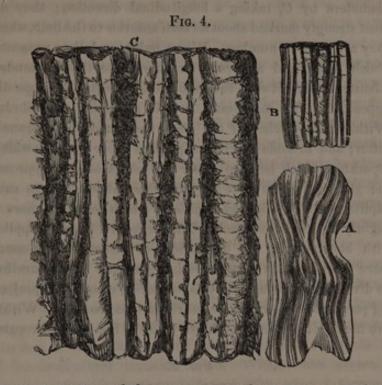


It is usually said, that the female has not a prostate, but merely an erectile tissue surrounding the neck of the bladder. If the word prostate be used with reference to its derivation, as standing before the vesiculæ seminales; certainly a woman has not a prostate, because she has no vesiculæ seminales; but she has the rudiments of a muscular substance, sometimes surrounding the commencement of her urethra, which is often as large as the prostate in a boy before the age of puberty, and resembles very nearly in external appearance the same part in the male. The ejaculatory ducts of the male, opening into the urethra, are of course wanting, and there do not appear to be any proper ducts of the part itself, so that this substance may be considered in the female to be entirely muscular, and destitute of the follicular structure, which gives the additional bulk to the male prostate. Cowper, who was well acquainted with this part in the female, calls it corpus globosum, and it performs in her, in all probability, the first office attributed to the prostate in man.

The prostate gland in the male has at least three offices viz., 1, to stand before the orifice of the bladder, to give support to it and the urethra which it surrounds, and a point more or less fixed, upon which it may act in expelling the urine; 2, to secrete a fluid peculiar to itself; and 3, to receive the ducts conveying secretions from other parts: which two latter uses cannot be attributed to it in the female, and the want of which may account for the difference of size in this part, in the two sexes.

The internal coat of the bladder, according to Mr. Quekett, consists of mucous membrane having an investment of epithelium, and a sub-mucous areolar tissue; it lines the interior of the bladder, and is continuous with that of the ureters and urethra; in the undistended state of the bladder it is thrown up into folds. The mucous membrane is largely supplied with vessels which form a more or less hexagonal network, and are most numerous in that part near the cervix termed the trigone, and around the openings of the ureters; in this latter situation the network is very close; between the meshes of some of the vessels, especially near the cervix, minute mucous follicles are situated. The epithelium of the bladder is of the squamous or tesselated variety, or rather a modification of that and the columnar; it is easily detached after death.

The mucous membrane of the urethra is continuous with that of the bladder, and throughout its course presents to the naked eye certain points worthy of observation in each of its divisions. The office of the uvula is said to be that of closing the orifice of the bladder in its undistended state. In front of this the mucous membrane is slightly rugous, the rugæ, as shown by A, fig. 4, passing on each side of an elevated triangular body, termed the verumontanum, or caput gallinaginis, which has in its centre an opening, termed sinus pocularis, leading into a cavity, described by Morgagni, Ackerman, Weber, Huschke, and others, as a rudimentary uterus, in the sides of which the two common ejaculatory ducts open. On either side of the verumontanum, which in many instances. extends into the membranous portion of the urethra, are the ducts of the prostate. Immediately in front of the membranous portion, the mucous membrane becomes very rugous, the rugæ taking a longitudinal direction; these are continued on to about the centre of the spongy portion, where they disappear, the membrane here being smooth and glistening. In this part the orifices of many lacunæ are visible; one of these, situated at



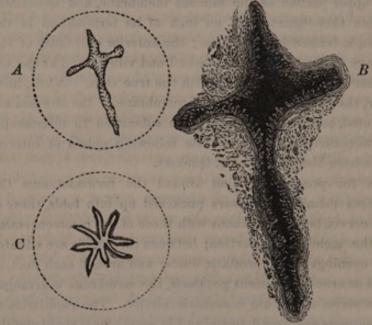
the upper portion of the mucous membrane, and sometimes within three-quarters of an inch of its termination in the glans, is termed *lacuna magna*; the anterior extremity of the spongy portion is more or less soft and villous, and at the external meatus is continuous with the true skin. When, however, the vessels of the mucous membrane of the urethra are injected, and its several parts are submitted to microscopic examination in succession, the following points of interest have been observed by Mr. Quekett.

In the prostatic portion around the verumontanum the mucous membrane appears puckered up into folds, those of the cervix being continuous with those of the commencement of the membranous portion; between these folds are situated the openings of the prostatic ducts; and around each duct, as well as around the *sinus pocularis*, the membrane is arranged in a series of minute concentric circles. The capillaries of these parts are very delicate, and in some places small papillæ occur. The mucous lining of the membranous portion is rather smoother than that of the prostatic; but immediately on entering on the spongy portion it becomes rugous, the rugæ, as shown of their natural size by B in Fig. 4, or magnified nine

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diameters by C, taking a longitudinal direction; they are most strongly marked about an inch anterior to the bulb, where they are nine in number. When uninjected, they present a bluish tinge, and a fibrous structure like that of tendon. About midway between the bulb and the meatus the rugæ disappear, but the membrane is still glistening and fibrous. Within three inches of the glans the mucous membrane is softer; and in some specimens papillæ occur in rows widely separated, which become closer and closer as they approach the glans, in which part they are most abundant. In each papilla there is a looped capillary, which in most cases is slightly twisted upon itself. The rugæ are largely supplied with bloodvessels, the depressions or furrows being much more vascular than the projecting portions. If the urethra be divided transversely, in this part of its course, the projecting portions of the rugæ are nearly in close contact. Within two inches of the bulb, as shown by A in Fig. 5, in a prepara-





tion of Mr. Hancock's, the section of the mucous membrane will very much resemble a large leech-bite, there being generally about three folds; in this situation, as represented by B, numerous papillæ sometimes occur. Still nearer the bulb the projecting portions are as many as six, seven, or nine in number, and the section at this part assumes a stellate form, as represented by C in Fig. 5. The basement membrane of the urethra is very thin, and in some parts can hardly be said to exist. The epithelium is of the tesselated variety; in the anterior part of the spongy portion nearer the bladder it is more or less spheroidal, being to all appearance situated upon a fibrous tissue. Immediately below the mucous membrane are the involuntary muscular fibres of Mr. Hancock, which, when seen in their natural condition, are rather smaller in size than those of the intestinal canal, and present a minutely granular appearance. When acted on by acetic acid, their elongated oval nuclei are plainly seen.*

Mr. Hunter entertained the idea that the urethra was muscular, as well as elastic. Sir E. Home and Mr. Bauer demonstrated a fibrous structure; but their histological knowledge was not sufficiently advanced to enable them to say whether it was muscular or not. It is now shown to be of the involuntary muscular kind. Within the muscular structure there is another, endowed with what I formerly termed vital elasticity, in distinction to that which is observable in caoutchouc, or in an ordinary spring. It is composed of the yellow elastic tissue now known to exist also in the second layer of the internal coats of an artery, and there termed fenestrated, from the fibres crossing frequently at right angles, leaving between them small window-like spaces, of a more or less cube-like shape.

The muscular structure now demonstrated brings more home to our comprehension the manner in which a contraction of any part of the urethra can commence, even if it should be of a single bundle of fibres, not thicker than a sheet of paper. When this contraction is *transitory*, the complaint is called SPASMODIC; when the contraction has become established, the stricture is then said to be PERMANENT.

^{*} Since the delivery of the lecture, Mr. Guthrie has ascertained that Professor Kölliker, of Wurtzburg, had published somewhat similar views of the involuntary muscles of the urethra as those entertained by Messrs. Hancock and Hogg, although without any one of these gentlemen having been acquainted with the labours of the others.

It is consolatory to gentlemen to be told that their obstruction is only spasmodic, inasmuch as it conveys the idea of the complaint being quite removable, the general impression being, that a permanent stricture may be relieved, but not cured-an opinion which is often correct, although frequently erroneous when an appropriate treatment is adopted. That the muscular structures which exist around the urethra are exposed to the occurrence of spasm, like all other similar structures of the body, cannot be doubted; nevertheless, it may be accurately said, that a spasmodic action of these parts, occurring spontaneously in a perfectly healthy man, is one of the rarest derangements which occurs in the human body. It is usually the consequence of irritation and inflammation of the mucous membrane of the urethra, which remain after the spasmodic action of the muscular parts has subsided, giving rise to the uneasy feeling experienced by the patient in the perinœum and adjacent parts, and to the sympathetic irritability of the bladder. Inflammation is, then, the first step in the formation of a spasmodic stricture, which is, therefore, always an inflammatory one, differing only from a permanent one in its being less dependent on a positive alteration of structure, but which alteration of structure is sure to ensue, if the state miscalled spasmodic is permitted long to continue.

The cases usually considered spasmodic are those of young men, who when suffering from gleet or gonorrhœa, which have been imperfectly or only partially cured, are tempted to commit some excess. They feel a desire to make water, which they repress, or perhaps indulge with some difficulty, but which increases, and is soon found to be irrelievable without assistance. The greater the effort, the more determined the straining, the greater the agony. The practice constantly stated to me by students, as most advisable in such cases, and which I as constantly censure, I hope for their advantage and that of mankind, is, to relieve the spasm by sending the patient to bed, by putting him in a hot bath, by fomenting the parts with hot anodyne fluids, by general bleeding, by the application of leeches, and by a dose of compound ipecacuanha powder,under the influence of which, in the course of a few hours of misery, it is possible the urine may begin to flow. I was taught a better practice, very many years ago, by a Scotch friend of mine, a young man, although an old soldier, who, after a debauch of this kind, which lasted half the night, found he could not make water when he awoke in the morning. He sent for me, begging I would bring a catheter. When I arrived, I proposed a warm bath, an opiate draught, &c. His answer was peremptory-" Damn your draughts, doctor: pass the catheter; I have had the stoppage before." I passed the instrument with some little difficulty, and drew off his water; upon which he jumped into bed, saying, " God bless you, doctor ! but damn your physic." In the afternoon he was nearly free from inconvenience. Since that time, I have always made it a rule to pass a small gum elastic catheter into the bladder, and draw off the urine, which gives instantaneous relief. An enema, composed of two or three grains of opium, dissolved in two ounces of warm water, should then be administered, which will usually remain, and by its sedative qualities, give effectual relief. It should be repeated every two or three hours, if the patient should not sleep, until the urine begins to flow, with half a grain of the muriate, or acetate, or other preparation of opium, in a pill or draught; and if the pain and desire to make water should return, the catheter should be again resorted to. It is only in very plethoric or inflammatory habits that bleeding of any kind is necessary to relieve the retention of urine, although the loss of blood locally, at a later period, often aids materially in promoting the removal of the cause of the complaint. A hot bath is a comforting, but not an essential, part of the treatment, more particularly as it cannot always be procured. When a person, under these circumstances, is restored to his usual state, and an examination is made of the urethra, a few days afterwards, by an instrument of a moderate or small size-and a large one should not be used-it will be found to pass readily, to the extent of from five to six inches, in the greater number of cases, when it begins to cause a sensation of pain, which was not experienced in the preceding part of its course. The surgeon is sensible of a resistance which is greater than might be expected, whether he uses a solid or a wax bougie, but which, after a little gentle pressure, yields, and the instrument passes into the bladder, without further inconvenience than its giving rise to a desire to make water. This is called overcoming a spasm; but it is a spasm which is always present, and not temporary. It cannot, therefore, be a spasm, the essential character of which rests on its being only of casual and temporary existence. It is a case of low or passive inflammation of the mucous membrane, which, if treated with gentleness, will always yield; but which, if treated roughly, ends in becoming a permanent complaint, giving rise to symptoms and inconveniences which may remain through life.

A permanent stricture depends upon some positive alteration of structure of the wall of the canal, the consequence of inflammation, which causes it to thicken, and at the same time deprives it of its capability of being dilated with the same facility, and to the same extent, as in a state of health. A stricture of this kind, which has offered, during life, considerable resistance to the passage of an instrument, may be found. after death, to have been formed by a mere line of irregular thickening, extending only for a third of an inch, in an oblique direction, along the canal. In most instances, it is more or less circular, generally affecting the under rather than the upper part. The most marked case of this kind I ever saw was at so short a distance from the orifice of the urethra, that it could be distinctly seen passing across the canal, like a thin fold of membrane. The opening for the passage of the urine was on the right side, and would only admit a small probe for the lachrymal duct to be passed into it. I cut through this septum, which resembled an opaque membrane drawn across the canal, and removed the disease, which appeared to be formed from the inner mucous membrane alone, and with it the irritability of the bladder, and the corresponding desire to make water, which had rendered him miserable. It is the course to be pursued in all such cases. It has been invariably successful, in my hands, for more than thirty years, and laid the foundation for that practice which I shall presently explain, when the alteration of structure occurs further back in the canal. The mucous membrane is, then, capable of producing a particular septum-like contraction in its proper canal, without the participation of its elastic or muscular coats; and of giving rise to a permanent stricture, generally, however,

curable. Repeated dissections have proved to me, however, that in other cases the external parts are always more or less implicated, and that the degree of implication is usually in proportion to the obstinacy of the stricture. Thus, for example, a stricture two inches from the orifice will be the most obstinate and the most difficult of cure, in which the corpus spongiosum is found to be hard and unyielding to the touch. It is only to be exceeded in obstinacy of resistance and difficulty of cure, when this part is smaller and harder-when it has in fact become impervious, or nearly so, to the blood, by which, in its erectile state, it ought to be distended. After a time, this hardened part-communicates to the finger applied externally, and to the point of the silver sound used internally, the feeling of its being cartilaginous and elastic. It yields to the pressure of an instrument, is dilatable, but not removable by dilatation in old cases, and returns by its resiliency to its ordinary state, when the distending power is withdrawn.

A gentleman finding great difficulty in micturition, applied to a practitioner of eminence in the Netherlands, who, after many trials, passed a gum elastic catheter into the bladder, as he supposed, and kept one there, changing it occasionally, for fourteen months. The water came by the side of it; and as the symptoms still continued unabated, the surgeon proposed to inject some warm water, with which he filled the rectum so full, that the patient discharged at once a pint or more per anum. He gave up the catheter, and came to London. The false passage began just anterior to the membranous part of the urethra, and the natural canal was so small, and the false passage so large, that everything took that road; and it was only after a great many trials, and after great attention and management, that a small gum elastic catheter could be passed into the bladder. After a few days, this was increased in size; and as he was in the habit of using instruments, he had others made to suit himself, and went on to No. 14. I now advised him not to increase the size, as a little urine came through some old fistulæ in perinæo, but to pass a smaller silver catheter every other day. He suffered no uneasiness from his elastic No. 14, and used to walk the streets and dine at his club with it in the bladder, without thinking about it. One morning he left out his gum catheter; and on trying to pass a silver one the

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next day, he found to his great surprise that the attempt to do so gave him excessive pain, and that it would not proceed even for half an inch. He came to me directly, saying a horrible spasm had seized him. I tried a No. 8, and found it would not go half an inch without great pain; a smaller one was arrested at three inches, by a spot which had heretofore shown little signs of disease, and was carried into the bladder with great difficulty.

This state of disease is not usually overcome by dilatation alone, however long-continued; and although the sensibility may be removed by different caustic remedies applied as sedatives, the complaint is not cured, nor the diseased structure removed.

That the muscular coat of a canal can exert an especial and long-continued influence upon it, without leaving any sign of a permanent contraction observable after death, I have had opportunities of seeing. It must, however, be admitted, that in these, the worst kind of elastic cartilaginous strictures, the inner layer, at least, of involuntary muscular fibres is involved in the disease, as well as the elastic areolar tissue, and add to the difficulty of cure.

A stricture of the urethra capable of causing much distress is, however, often formed by a simple fold of mucous membrane, of a semicircular form, usually situated at the under part of the urethra, and not unfrequently more than the sixteenth part of an inch in thickness. When the irregularity takes a spiral or a longitudinal course, which is rare, it is less curable, and when the stricture is from a quarter of an inch to an inch in extent, it is commonly supposed that two or more points of inflammation have each given rise to alteration of structure, which under repeated attacks have formed, from contiguity of parts, the hard and almost cartilaginous mass alluded to.

The canal in front of a stricture does not seem to be influenced by it, as far as regards its permeability or elasticity. It remains in its natural state, unless affected by inflammation, although the actual surface or anterior part of the stricture itself is often extremely irritable, bleeding as well as being very painful on the slightest touch. The bladder, under constant action and straining, thickens, diminishes in size, be-

comes irritable, and impatient of its contents; whilst the urethra immediately behind the stricture becomes more irritable than before it. Little is wanting in such cases, to give rise to complete retention of urine, ulceration at the irritable spot, the effusion of urine into the surrounding parts, and the death of the patient, unless the science as well as the art of surgery is brought to his relief. In three cases, which I have had the opportunity of examining after death, these evils were brought on by the impacting of a small calculus in the posterior part of the stricture, the dilated part behind being as large as a small orange. This dilatation does not, however, always take place, more particularly when the stricture is immediately anterior to the membranous portion of the urethra: and the surgeon, when obliged to open this part in cases of obstinate retention of urine, must not only not rely on its occurrence, but, on the contrary, must not expect to find it. That an opinion is entertained and taught to the contrary, I am well aware; it arose, however, from one or two surgeons of eminence generalizing too much from a few isolated facts, and believing an accidental dilatation to be one of frequent occurrence. It is a misconception I am particularly desirous of removing; for an inexperienced surgeon suddenly called upon to open the membranous part of the urethra in a case of retention of urine, admitting of no relief except by operation, might be much disconcerted at not finding such dilatation to guide him at the most important moment of his operation, but merely a urethra of the natural size.

It is an admitted fact, that when a stricture of the urethra can be cured by dilatation, this method should be adopted in preference to all others. When it is found unequal to this object, recourse must be had to other means; and the application of caustics, such as the nitrate of silver and the potassa fusa, has been resorted to, sometimes with good, at others with bad success; but as they rarely or never succeed in effecting a permanent cure in intractable cases, whilst they often do much mischief, they are now seldom used by surgeons in general, although the potassa fusa has again of late been strongly recommended by my old student and friend, Mr. Wade, as being very successful in his hands. I refrain, however, from entering into this subject, the object of the present lecture being to inquire into those means which are supposed to lead to a permanent cure, or the nearest possible state to it in cases of the worst description. These means are operative —by division of the part diseased.

The operative processes for effecting these objects are twoone by opening the perinæum from *without*, and dividing the stricture; the other by dividing the stricture from *within*, by an instrument passed along the canal of the urethra.

The operation of opening the urethra from the perinæum was known to the ancients. From the instruments which have been discovered, it was practised in all probability by the surgeons of Herculaneum and Pompeii. It was certainly known to the Arabians Rhazes and Avicenna. The older French surgeons called the operation "la boutonnière;" and are explicit on its difficulties and its dangers, particularly when they attempted it, in consequence of being unable to pass a staff or guide to cut upon into the bladder. Colot, the lithotomist, says, in a case of a man in great danger, he passed a very small sound, as a last resource, down to the stricture in the perinæum, on the point of which he cut, and through the opening thus made he pushed another small sound into the bladder. Upon this he passed a director with some force, and then another between them, thus dilating and tearing the parts which had become callous. When the surgeon failed to open the urethra, and was near the bladder, he recommended a trocar to be pushed into it, or he opened it with a straight pointed knife, passed steadily on until the urine flowed, an operation which is alluded to by some modern writers, but which no one ought to do, even if it has ever of late been done. The views of our predecessors were however correct, although their operative methods were objectionable. Thus, Sabatier and Deschamps consider as nearly impracticable the operation I have proved to be exceedingly simple. Their successor, Desault, disapproved of it, and Chopart concluded his observations on the subject with the hope that surgery in its advancement would ultimately find the means of dispensing with it altogether; not conceiving for a moment that it would, by the aid of anatomy, establish it as the least difficult and the most simple and scientific mode of giving relief in cases of extreme danger from retention of urine.

I have alluded to these opinions that I may not suffer the reproach made against us islanders by M. Civiale, "that our neighbours of the other side of the Channel willingly forget, on this point, as well as on many others, what is done out of their own country;" and I admit readily, with him, that the operation alluded to cannot be attributed to either Hunter or Home. My able friend, M. Civiale, has, however, fallen himself into the error he animadverts upon, of occasionally forgetting his neighbours d'outre-mer. Thus, in a short sketch of operations of this kind, done by various surgeons, he notices those mentioned by Messrs. Brodie and Arnott, the former even by quotation, for the purpose of contrasting the difficulties acknowledged by him to exist, with the exaggerations as he terms them, of the facility with which other English surgeons say it may be accomplished; but he does not quote nor even refer to those surgeons, of whom I may perhaps consider myself without impropriety, to be the principal, from having been the first to recommend, not the operation he has commented upon, but the other which ought always to supersede it; to which he does not refer, although the first edition of my work on the "Anatomy and Diseases of the Urinary Organs" was published in 1830, the third in 1843.

M. Civiale, in summing up his objections, draws attention to a case published in America in 1844, in which, after various efforts made in vain to find the urethra from the perinæum, by an incision two inches deep and five inches long, the surgeon ended by failing to open even the bladder by the knife, and had recourse to a trocar, which he pushed into it. The difficulties met therein, arose from the operation being done in the wrong place, and it was so in every case to which he has referred. To find the urethra without the aid of a staff previously introduced into it, the operation should be performed through the raphé, in the exact central line of the perinæum, and not laterally as in the operation for the stone. The directions for doing this I have given in my lectures since 1816, and have published since 1830; they are to be found at page 107 of my book, and are so precise as to be unmistakable.

The patient being placed as in the operation for the stone, a straight-grooved staff or sound is to be passed down to the stricture, and held steadily against it. The rectum having

been previously cleared by an enema, the forefinger of the left hand being duly oiled, is to be introduced into it, and the state of the membranous part of the urethra and the prostate is to be carefully ascertained. The principal object in introducing the forefinger, is to ascertain the relative situation of the upper part of the rectum and the urethra, which latter part is only in direct application to the rectum near the termination of its membranous part and the commencement of its prostatic portion. There is a certain distance, which is greater or less in different individuals, between the last inch of the rectum and the urethra placed above it. The two parts form two sides of a triangle, the apex of which is the prostate, the base the external skin; and it is within the two lines of the triangle that the operation is to be done. The surgeon, taking the grooved staff, or sound, in his right hand, whilst the forefinger is applied to the upper surface of the rectum, moves the point steadily upwards and downwards, so as to convey to the forefinger of the left hand a knowledge of the situation of the extremity of the instrument, and particularly of the distance between them; and which the motions given to the instrument by the right hand will clearly indicate. The thickness of the parts between the obstruction and the rectum can thus be estimated with sufficient accuracy, both at the point where the left forefinger is applied, and at the surface of the skin; for, although the membranous part of the urethra cannot be easily felt from an incision made on the left side of the perinæum, it is distinguished in the plainest manner from the rectum. The next step of the operation is to divide the skin, cellular membrane, fascia, muscular and tendinous fibres, which intervene between the upper surface of the rectum and the under surface of the anterior and middle portions of the membranous part of the urethra. This is to be done by a straight, blunt-backed, narrow, sharppointed bistoury, fixed in its handle; the point of which is to be placed on the skin, a little above the verge of the anus, the cutting edge being upwards, the blunt back towards the rectum, the handle being a little depressed, the point somewhat inclined upwards. The degree of inclination necessary to carry the knife inwards for the distance of an inch, and clear of the rectum, will be indicated by the finger in that

part; and the eye of the operator should correspond with the point of the forefinger in the rectum, so that the bistoury may be steadily pressed in to that extent, then carried upwards, and brought out in the exact median line, making an external incision of at least an inch and a half to two inches, or more if necessary, as regards the external parts. If the perinæum is much hardened, and consequently unyielding, a transverse, curved, or crescentic incision should be made across it, the centre of which should correspond with the raphé, and be half an inch above the verge of the anus, or as near that distance as may be, with due regard to the safety of the rectum. The surgeon may then deepen the cut without fear, for the forefinger in the rectum will always inform him where the back and the point of the bistoury are. The opening will now be sufficiently large to allow the operator to lay aside the knife, and to feel for the urethra with the point of the forefinger of the left hand, keeping the end of the staff steady against the stricture, which will be readily felt, and through which the instrument will now sometimes pass with a little pressure. If it should not do so, the knife is to be resumed, and the forefinger being placed in the wound, on the outside of the rectum, which is to be depressed as much as possible, the back of the knife is then to be turned to it, and whilst the patient strains, the point should open the urethra, which it can do very easily, as far back, if required, as the apex or transverse portion of the prostate. It will not be necessary, however, to go so far back, and the membranous portion may be opened at its middle or anterior part with perfect safety. A probe should be introduced into it whilst the urine is flowing.

The bulb of the urethra, in the natural state, is not the pendulous part which it seems to be when dissected for demonstration. It is on the contrary closely applied to the under surface of the urethra, overlapping a portion of its membranous part, and especially and particularly the spot at and before its commencement, in which the most intractable strictures are situated. That there may be some equally unmanageable anterior to this part must be admitted, but there are none behind it. None are so impracticable, none so difficult of cure, none so distressing to the surgeon, whether under ordinary management, or under operation when impassable.

The bulb of the urethra, in all or any of these operations, must be divided, and has sometimes given rise to a dangerous hæmorrhage. This has never occurred in my hands, which may perhaps be owing to the care taken to divide the bulb exactly in its central part, where the two portions of which it is composed meet each in its respective sheath, thus forming a double partition between the highly vascular structures. Be this as it may, a hæmorrhage from this part may be very troublesome, but can always be arrested by pressure made in the wound, which should be enlarged upwards, if necessary, to allow of a greater facility for its performance. I place no reliance on the opinion which has been promulgated, that the division or a wound of the bulb is followed by sexual inconveniences. The distance from the surface of the perinæum to the membranous part of the urethra, near the apex of the prostate, is about an inch and a quarter in persons of the usual size and form. When the perinœum is very deep, it may be an inch and a half, but rarely or never more, as far as has been demonstrated by numerous experiments made for the purpose, and which have been lately repeated at my request by Dr. Beith, of Greenwich Hospital, with a similar result. If the membranous part of the urethra should be dilated, an opening is more easily made into it, but this must not be expected, as it rarely takes place. The patient should therefore be desired to make an effort to expel his urine, that the surgeon may have the advantage of feeling the distending effort with the point of his finger, as he opens the urethra. If the operation has been performed for retention of urine, the safety of the sufferer is ensured, and nothing more need be done; but as the patient, in submitting to an operation, expects that the original cause should be removed, reference must be had to the stricture, which is, in all probability, half, or at least a quarter of an inch distant from and above the opening which has been made to evacuate the urine. The grooved sound, or staff, in the anterior part of the passage, is now to be firmly pressed against the stricture, whilst a curved probe or director is, if possible, to be passed upwards, as far as it will go, to meet it. The operator has then the choice of dividing

the strictured or obliterated part, upwards or downwards, as he pleases. After which, a catheter is to be passed, and fixed in the bladder; but if its mucous membrane should be very irritable, which is likely to be the case, the catheter should be withdrawn as soon as it is found to give rise to an increase, or even to a continuation of the sufferings of the patient.

Chloroform should not be used in an operation required for retention of urine. Its adoption is disadvantageous, inasmuch as there is oftentimes very great difficulty experienced in finding the opening made into the urethra, when the spot cannot be shown by the passage of the urine through it.

The introduction of a flexible gum catheter through the divided urethra into the bladder is usually mentioned by writers as a matter of course; it is, however, often one of great difficulty, particularly if the bladder should be empty, or the patient, under chloroform, cannot expel his urine when desired. When a common director can be, or is even, passed into the bladder, neither a silver nor an elastic catheter can always be made to accompany or replace it. A soft metallic director should in all cases be used for this purpose, and of a shape which allows the groove to widen rapidly from the point to the handle, to the extent of half an inch, forming a deep furrow, larger than the catheter to be introduced, and along which when properly curved, after it has been brought out through the wound, it may be passed from the anterior part of the urethra into the bladder.

In a case of fistula in perinæo, through which the urine can always be discharged, the operation may be done at any convenient time, and the surgeon may, perhaps, prefer dividing the stricture first, although impassable, with the hope of having nothing more to do. To effect this, a straight, deeplygrooved sound is to be passed down to the stricture, and then made prominent in the urethra, until the external parts are all divided save its inner membrane. The prominent point is then to be withdrawn, and held steadily against the base of the obstruction, immediately above which the urethra is to be opened, and the smallest probe or the smallest director passed if possible through the stricture into the membranous part of the passage, and the thickened part divided. When a probe or small director will not pass, the division of the obstruction may become a matter of difficulty. The soft parts, during these attempts, should be drawn asunder by small, flat, blunt, but bent hooks, which the surgeon should have had previously prepared for the purpose, so as to expose the obstructed part as much as possible, until he can effect his object of dividing it.

The operation I have thus recommended, and I believe I may say introduced into the practice of surgery, should be frequently done by the student on the dead body, after a small grooved sound or staff has been passed into the bladder. It may then be effected by one steady introduction of a straightbacked, strong-pointed knife; and whilst it is a momentary operation on the dead, it may be done on the living in three or four minutes, with all due precautions, even without the aid of a staff in the urethra. It must, however, be admitted that the operation cannot be done in every case without serious difficulty and loss of time, to the great distress of the patient, and particularly, I repeat-for the direction is important-if the bladder be empty. When any kind of solid instrument, however small, can be passed into the bladder, it becomes an operation of no import, as far as regards the mere division of the intervening parts, and may be done by any person of moderate knowledge in anatomy and surgery.

Mr. Syme, professor of surgery in the Royal Infirmary in Edinburgh, has lately recommended this or a similar operation to be performed in all cases of irritable and intractable strictures in which he could pass a grooved staff into the bladder, not as an absolutely necessary, but as a curative process. If he had had the misfortune to meet with a case in which he could not pass an instrument of any kind into the bladder-a misfortune which has occasionally befallen all surgeons of extensive practice amongst the poor or the unfortunate-I presume he would have done the operation precisely as I have done it and recommended it to be done for thirty years at least; and I cannot but regret, that he had not had the opportunity of knowing what I had done, and had consequently confined his observations to reprobating the old operation by the side of the raphé, the boutonnière of the French surgeons, which very operation mine was intended to supersede, and has indeed superseded, with most well-informed surgeons. CASE 1.—Reference was made to me, in Lisbon, in 1813, for my decision on a case of retention of urine in a soldier suffering from an impassable stricture, in whom an effusion of urine was immediately impending, whilst his anxiety and distress were great. The point of stricture could be distinctly felt through the very lowest part of the scrotum, at the commencement of the bulbous portion of the urethra, which was evidently dilated at each endeavour to force the urine through the stricture. The integuments being divided, I opened the distended bulbous portion with the same instrument, a straight bistoury, and the patient was immediately relieved. The stricture was then divided, and the man recovered without a bad symptom.

CASE 2.—In the year 1814, I assisted the late Mr. Pearson in dividing a hard, impassable stricture, at the commencement of the fore part of the scrotum. A catheter was placed in the bladder, and the wound healed after several weeks, with difficulty, bougies being passed from time to time as cicatrization took place, to maintain the passage at its proper size. At the end of a year he came to me for advice, being nearly as bad as before the operation, the division of the part nothaving been successful in preventing a return of the disease.

The patient in this case received no permanent benefit from this operation as a curative process, although it was of great advantage to him at the moment; and if he had passed his bougie carefully from time to time, a complete relapse would have been prevented, and he might have remained in good health. The inconvenience in dividing the urethra in its pendulous portion, arises from its disinclination to heal, and its aptitude to form a fistulous opening, a result so common, that an incision should never be made into this part, if it can be avoided by the adoption of any other means.

CASE 3.—The late Dr. O'Halloran, of the 60th regiment, suffered many years from stricture, and having attended my lectures thirty years ago, and heard my opinions on this subject, and seen me do the operation, found, when in the West Indies, some three years afterwards, that a stricture he had neglected had become impassable, and that he could not make a drop of water. Being a man of great resolution, he determined on dividing the stricture himself, which he did before a glass, opening the perinæum immediately behind the lower part of the scrotum. The recovery was speedy, and the cure complete, as he assured me some years afterwards, he having no occasion to pass an instrument to keep the passage in its proper state.

CASE 4.—In November, 1827, I divided the perinæum in its central line, opened the urethra in its membranous part, and divided a very intractable stricture upwards, in the person of Lieutenant Y——, of the Royal Navy, Mr. Travers being present. The operation was successful as far as the immediate relief obtained, although the patient did not eventually recover, dying from disease of the bladder and kidnies.

I have related other cases in which this operation was done, in my work on the "Anatomy and Diseases of the Urinary Organs," to which I may now refer you, with respect to my having constantly done this operation with complete success, although all required a bougie to be occasionally passed to prevent a relapse.

CASE 5.—R. M—— was sent by me to the Westminster Hospital, in 1843, with an effusion of urine into the scrotum, in consequence of a stricture having been divided in the urethra, with such constitutional derangement of health as to render his recovery very doubtful. At the end of eleven weeks, I divided the stricture through the perinæum, but did not succeed in passing an elastic catheter along the urethra into the bladder, until the next day, when the bladder was full. This he wore for ten weeks, and now keeps the passage clear by passing a No. 9, from week to week, which, if he neglects for three weeks he finds a difficulty in doing.

CASE 6.—A gentleman has been under my care for several years, at different times. The first time he recovered so as to be able to pass a bougie the size of the urethra with ease. From neglect his complaint returned, the strictures, particularly the one at the bulbous portion, became irritable, and he could not bear it to be touched. He tried the cold-water cure in Germany, and pronounced himself well; his sufferings however returned, and he underwent a year's treatment in Paris, with some little benefit, being obliged however to pass a bougie himself occasionally. In this state he came under my care for the third time-that is, as far as letting me see him pass a very small bougie for himself, for he could not bear any one touching him. I persuaded him to try some chloroform, and let me, when under it, divide the stricture. The use of chloroform, being then in its infancy, did not succeed, and he left London much better in health, but by no means free from inconvenience. Hearing that he had had his stricture divided by a section of the perinæum, I inquired his state. The following was the reply some five months after the operation had been done: "Yes, I have had my stricture divided, on the 13th or 14th of last November, under chloroform; with me it has not succeeded. I of course suffered a good deal for the first week or so; indeed, more I think than I ever suffered in my life. It produced stoppage of water, and hot and cold fever, accompanied by weakness and depression for the first ten days or so. At the end of six weeks I was certainly better for a short time than I had been before the operation; I mean, as far as regards my water-works, but that did not last, and I now am confident I have derived no benefit at all. You ask me as regards the effect it had on my bladder. I must tell you, that for the last two years, from pure air, and very quiet life, the diseased state of my bladder has been gradually subsiding, without any treatment; indeed, since I left you in London, now near three years, I have not consulted anyone except for this said operation, which, by the way, was not done in Glasgow, as you suppose, but in Edinburgh, and it has not succeeded. I do not mention the surgeon's name, for he did his very best for me. I pass a No. 4 French gauge, have an occasional pain in my back, and am obliged to take morphia at night, but not so much as formerly."

If this gentleman had returned to London, I should have performed this operation, and I presume with a similar result. I am better satisfied it has been done by another, it being the case of all others I am or have been acquainted with, I should have selected for a trial of the real value of the operation in effecting a permanent cure.

Mr. Stanley has lately shown me, in St. Bartholomew's

Hospital, three persons in whom he had opened the urethra by a central incision, all bad cases, in which effusion of urine had begun, rendering the operations imperatively necessary. In one done twenty-two months back there is still a fistulous opening in the perinæum, through which half his urine passes. In the second, the stricture was divided at the upper part of the scrotum; the opening is fistulous. In the third, the urethra was laid open, in September last, from the upper part of the scrotum down between the testes to its lower part, where some urine still escapes. The lives of all three were saved by the operation.

CASE 7.-G. E----, in 1840, when twenty years of age, in vaulting over a gate, fell upon it and struck the perinæum. On trying to pass his water a good deal of blood came away, and he suffered much pain. Cold was applied, but an abscess formed in perinæo, which was opened in London. It was now found a bougie would not pass, and after a good deal of force, a false passage was made, which eventually led to an operation in the perinæum for the division of the stricture, which was done by a lateral incision, enlarged transversely. Fever supervened, but ultimately a No. 9 catheter was passed, and at the end of ten weeks the wound healed, and he was enabled to pass a No. 6 soft bougie for himself. In 1843 he went to India, and after an attack of dysentery, having neglected the use of his bougie, was attacked by a retention of urine, and from that time suffered greatly until he returned home in 1850, and put himself under the care of Mr. Guthrie. The orifice of the stricture was so narrow that a catgut bougie of the smallest size would rarely enter it, the bougie of whatever kind generally taking the false passage, the irritation of the bladder and the desire to make water being always great and scarcely relieved by opium. All the symptoms were now aggravated by gonorrhœa, after which he went into the country. On his return to London, advantage was taken of Mr. Avery's reflector to look at the orifice of the stricture, and a small solid silver sound was passed through it, but nothing would go further than before, nor beyond seven inches, the sensation described being that of the gut being raised on the point of the instrument, which could

be felt per rectum but not in the bladder. Under these circumstances, I opened the perinæum and urethra, dividing the stricture upwards. Great difficulty and delay were experienced in getting a director, either small or large, into the bladder, from his not being able to pass urine, and from the obstruction at the neck of the bladder, on which the end of the instrument caught. A gum catheter was however introduced, but from the irritability of the patient often slipped out and was replaced with difficulty, and only after taking a particular curve which carried it over the bar at the cervix of the bladder. The patient can now pass a No. 12 for himself, having an especial curvature, and will not hear of the bar being divided. A small fistulous opening remains in the perinæum, allowing a little urine to pass through, when he does not cover it with the point of his finger. He is otherwise free from uneasiness and in perfect health.

The operation for the division of a stricture from before backwards, or by passing an instrument along the urethra to the obstruction, is due to Mr. Stafford, and is effected by means of a silver tube, made in the shape of a straight or curved catheter, containing a lancet or other shaped knife, which can be protruded, and again withdrawn through a slit in the point, to such extent as may be deemed advisable, by means of a spring at the other end or handle. With an instrument of this kind, a simple bridle stricture, or one of an eighth of an inch in thickness, may always be divided, with little risk or difficulty; but when the obstruction is of greater extent, and of a more solid consistence, the operation is attended with some danger, and has even failed altogether. When the obstruction is at the termination of the bulbous part of the urethra, the slightest error in the direction of the instrument leads to the formation of a false passage, and the object of the operation is defeated, whilst the subsequent attainment of the right road is rendered much more difficult, and sometimes impossible.

The enlargement shown in figure 1, which the bulb makes when distended by injection, can always be caused, in a healthy person, by a moderate pressure made at the lower part of even a natural obstruction, if there be one, so as to cause the point of a silver instrument to stop at it so steadily, that a change of the position of the point can alone carry it past the obstacle; but on this change being made, a full-sized instrument can be passed over the natural obstacle formed by the fascia beneath into the bladder. With a small sound or catheter, an inexperienced surgeon will frequently find at this part what he calls a stricture; and a better but perhaps less honest surgeon can always make one to answer his purpose, until at last he may really render a natural obstacle a source of disease.

When a bad stricture exists at this part, and bougies have perhaps been passed irregularly for years, or until it becomes intractable or impassable from neglect, this dilatation will always, as a general rule, be found to exist; and as the surface of the stricture is hard and resisting, whilst the dilated part is softer and more yielding, the end of any instrument will certainly be borne against it, and a false passage may be readily made. This is a surgical point which experience alone can rectify; nevertheless, a distinct acquaintance with the fact will go far to prevent the evil. It will not, however, suffice without a correct knowledge of the relative situation of the parts, in health and under disease, which is their true anatomy. A mere knowledge of their structure from books, however accurate, will be of no use in this operation. The surgeon must depend on his experience, which may be called knowledge-on his head, his eyes, his hands-for all must be engaged in it. It is an operation of dexterity, rather than of difficulty, in bad cases. In slight ones, it is hardly worthy of consideration, and is often thoroughly successful.

For the purpose of securing the passage of the dividing instrument in the right direction, Mr. Stafford proposed to pass a fine wire through the stricture in the first instance, and then to run his knife along it: a grooved director has been suggested by others. The difficulty is, however, to pass the wire or director; for when a wire can be safely passed through a stricture into the bladder, the disease ceases to be immediately dangerous; the urine can be drained off, and the passage may be quickly enlarged, so as to admit of a safer mode of proceeding—viz., by dividing the obstruction from behind forwards. This enlargement can be accomplished by running a hollow instrument over the wire which has been passed, after the manner lately recommended by Mr. Wakley, junior, and it is impossible to speak too highly of this invention,-or as it is disputed as an invention, and claimed by others,-of its re-introduction into practice, as a means of effecting either a slow or a rapid dilatation of the urethra. It is, like all other potent means, liable to do much mischief as well as good, when in incautious hands; and in cases of long standing cannot effect a permanent cure any more than any of the other dilating methods more commonly in use. It is capable of rendering great service when the withdrawal of a sound or catheter cannot always be certainly followed by the re-introduction of another, and which withdrawal it renders unnecessary until a larger one is introduced over it - a very great improvement, which no surgeon should neglect, for when this can be done, no operation is immediately necessary. M. Le Roy d'Etiolles has recommended a similar mode of cure, or of forcible dilatation, by passing in immediate succession several graduated instruments until the last fills the urethra; thus stretching or lacerating the stricture, sometimes effecting a cure in a few days, sometimes giving rise to inflammation of the bladder or other evils, which few people like to contemplate. These means, as methods of cure, can then only be recommended when from circumstances, the patient cannot afford time for more gentle treatment. They succeed frequently when the disease is confined to the mucous membrane; and some of the best and most prominent cures I have effected have been in such cases, and when I have felt that the edge of the stricture has caught upon and yielded to the pressure of the point of the instrument: whence my predilection for the more surgical proceeding, by division from behind forwards, when it can be effected. M. Le Roy d'Etiolles sent me his book, which I fear some gentleman has borrowed without leave, and M. Baillière, of Regent-street, could not procure one in Paris even from M. Le Roy himself, it being out of print, which prevents my further notice of this and of his other ingenious methods of treatment.

When no immediate urgency presses for the hasty completion of an operation, as in ordinary cases of intractable stricture, permeable to a certain degree to the urine, although not to an instrument, it is always best to proceed with gentleness; for I have often found that an instrument can be introduced

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at one time, when it totally fails to proceed at another. Mr. Syme has denied the impermeability of stricture to a small instrument under any circumstances, which denial does not gain implicit credence with the best informed members of the profession of surgery; although all ought, and I hope do admit, that his efforts to impress on the members of that profession the necessity of continuing their endeavours to find a passage until they succeed if it be possible, are deserving of the highest praise.

The width or extent of a stricture can always be ascertained when it is passable by a small silver or whalebone sound having a little bulb at the end, which on being withdrawn is caught behind the stricture, and comes through it with a jerk, thus showing its thickness.

CASE 8.—An officer applied to me with two strictures, one an inch from the orifice of the urethra, the other at about four; he suffered greatly from irritation and a frequent desire to make water, which rendered his life very uncomfortable, although he could pass a bougie of small size easily. Both strictures were divided on different days with facility, one from before backwards, the other from behind forwards, and the cure was rapidly completed. This gentleman does not pass a bougie, has had no return of the complaint, has married, has three children, and boasts of his cure.

CASE 9.—A gentleman had been under the care of several surgeons as well as myself, and could pass a No. 14, and even a 16, in a satisfactory manner, but his uneasiness about the the bladder and urethra was not removed; and if he neglected to pass his instrument for a couple of months the canal contracted a little, so as only to take a No. 12, and a slight ridge was felt as the sound passed over the part. This I divided, with the happiest effect; the uneasiness was no longer felt, and he now only passes his sound to be quite sure his complaint is not returning, but not to prevent its return.

CASE 10.---A serjeant of exemplary character was sent to me by his commanding officer, suffering from an impassable stricture, and rendered thereby unfit for further service unless I could give him relief. The stricture was at the bulbous part of the urethra, through which I could not pass either a soft or a solid instrument without more force than I thought fit to employ. A slight division of the face of the stricture enabled me to carry a small silver catheter through it, which was retained in the bladder. Exchanged in succession, for others somewhat larger, the cure was apparently completed by dilatation, and he returned to his duty free from complaint, with the direction to pass a solid sound once a week. This he failed to do, and in less than two years he returned to me nearly as bad as before. The stricture was entirely divided this time, and he again returned to his regiment. He has remained well many years, not forgetting to pass his sound from time to time, that he may be sure his complaint shall not return.

CASE 11.—An officer of the navy applied, in consequence of an intractable stricture at the termination of the bulbous part of the urethra. He had been under thirteen different surgeons, who had never been able to pass an instrument into the bladder, and was subjected to rigors amounting to a paroxysm of ague, whenever the surface of the stricture was irritated by even moderate pressure. It was evident to me that nothing but incision was likely to succeed. A slight one rendered the small orifice of the stricture more open, and a very small sound was with some difficulty carried into the bladder; this was replaced by larger ones until he could pass a bougie equal to the size of his urethra, which he does from time to time, and remains well, although the occasional passage of the bougie is necessary to prevent a relapse.

CASE 12.—An officer of the Indian army applied to me in consequence of a hard elastic stricture at the termination of the bulbous part of the urethra, on its becoming membranous, which gave him great annoyance, though passable and dilatable. The dilatation could not be maintained by any sized bougies. The obstruction was always felt by the instrument in passing over it, and more or less uneasiness was always present. As he was desirous of being relieved at all hazards, I divided the hardened part, or ridge, with a full-sized instrument, which then passed into the bladder with ease. A little discharge of blood took place, but not more than frequently follows on such occasions. The next day I found that he had had an oozing of blood all night, that he could not make water, although the desire was constant, and was in great pain, the bladder being much distended. He had had rigors in the night, followed by considerable fever, thirst, foul tongue, headache; the oozing of blood continued, accompanied by the occasional discharge of a few drops of bloody urine, and of some clots of blood. A middle-sized silver catheter passed with ease, although very little bloody urine came through it, and it was evident a larger quantity of blood had passed backwards, and had coagulated in the bladder, than had been discharged externally. Relief was given by injecting the bladder from time to time with warm water, by opium, and the hot bath, &c. The cold and hot paroxysms of fever returned regularly, which he considered to be his Indian malady, and were ultimately arrested by quinine. His complaint was, however, cured, and has not returned during the last six years, as he calls to be examined from time to time. This was the most distressing case of hæmorrhage I have met with, although it sometimes occurs, but to a less extent, after this operation, but it is not usually in such quantity as to excite alarm, or give rise to any serious inconvenience.

CASE 13.-C. P- applied to me on his return from India in a miserable state of health, unable to make water even in a small stream, from strictures, which admitted with difficulty the smallest bougie. The first was situated two inches from the orifice; the second at the junction of the bulbous with the membranous portion of the urethra, under which he had laboured for several years. The first could be felt as a very hard swelling in the under part of the urethra, near half an inch in extent, and on which dilatation and caustics, used by different surgeons, had made no permanent impression. This part I divided from before backwards, so as to admit a No. 6 catheter, which after a time passed through the second, and his health rapidly improved as the irritation was removed. The hardness in the first stricture did not diminish, and it was again divided, so as to admit a No. 9. A small calculus was now discovered behind it, lodged in a hollow it had made for itself, and in which it had perhaps increased in size. This, after repeated trials and the further division of the stricture, was happily brought through it, but passed the orifice of the urethra with great difficulty. A catheter the full size of the urethra was kept in the bladder, and the posterior stricture was removed, but the anterior one remained hard and frequently somewhat irritable, although his health was quite restored, and he could pass a No. 8 easily. It was again divided as deeply as was thought advisable, and the nitrate-ofsilver ointment applied, which always removed the irritability; so that by passing his bougie himself, and by occasionally applying the ointment, he kept himself in good health. With the view of obtaining a more permanent cure, a consultation was held, and the iodide-of-potassium ointment applied externally and internally, instead of the nitrate-of-silver ointment, but did not answer so well. He ultimately returned to India in excellent health, satisfied to pass his bougie and use his ointment occasionally. He has remained free from inconvenience, having since his treatment passed several small lithic-acid calculi with little difficulty, although the hardened ring of the stricture was always to be felt, and is still, I have no doubt, perceptible.

CASE 14 .- A poor man was admitted under my care into the Westminster Hospital, with a diseased bladder and strictures; the first of which, about two inches from the orifice, had become impassable, so that his water, which he could before only make by drops, was now entirely retained. As he had suffered much, and appeared to be in an almost irrecoverable state of health, requiring immediate assistance, if it could be given in time to be of use, I divided the first strictures, which were hard and double, extending for an inch. with a small interval between them, with an instrument as large as the orifice would admit. This gave him great relief, as he could then pass his water in a small stream. Two days after, some urine came through into the skin of the penis and scrotum, which required to be divided to allow of its exit, and a fistulous opening would thus have been made. if the man had not died exhausted by the long continuance of his complaint.

CASE 15.-A short, fat gentleman, of sixty-three, informed me, in May, 1850, that he had been under my care, for retention of urine, twenty years before, and that he had left me when I could pass a No. 12 with ease, being as large an instrument as would enter the orifice of the urethra; and that he had done nothing since. He was nearly as bad as before, his water passing only by drops. The obstruction was at the termination of the bulbous portion of the urethra; and although a very fine gum elastic or catgut bougie could be made to enter the stricture, and stick fast in it, neither they, nor the smallest solid one, would proceed, without a force being used which I considered incompatible with safety. Having neglected to call for a few days, he sent for me, saying he was totally unable to pass a drop of water, and had not done so for nearly two days, the bladder being distended as high as the umbilicus. There was no time to be lost, if his life was to be saved. I therefore divided the obstruction, which was very thick and tough, with great difficulty. The cutting part being sheathed, the instrument could then be felt per rectum, advancing to the prostatic part of the urethra; but it would not enter the bladder, nothing could make it do so. It evidently caught upon something at the very entrance into it, and I concluded it must be on the bar I have indicated as often existing at this part. This I divided; the instrument then entered the bladder, and three pints of urine were drawn off through it, when it was exchanged for a soft metallic catheter. The general bad symptoms gradually subsided, the urethra remaining hard and lumpy where the division had taken place. In August, I took my leave of him, in a very comfortable state, passing his gum catheter twice a day, and making his water occasionally very well. At Christmas I saw him, when he declared himself free from any uneasiness. In February, he suffered an attack of bronchitis, for which he did not ask my assistance, although I paid him a visit of condolence, declaring himself well of my complaints-that is, of the bladder and urethra. In April, he died from a fit of apoplexy, and his friends would not allow of an examination. The surgeon who attended with me did not hesitate in saying, that if I had performed the operation by opening the perinæum he would not have lived many days.

CASE 16 .- H----, returned to England from Australia, in July, 1848, having suffered severely from an impassable stricture, placed himself under the care of several very eminent surgeons in London, who tried various methods and inventions, and ended by making him a false passage, admitting a No. 7 for eleven inches, but which could not be got into his bladder. All this time he suffered severely in his health, from repeated attacks of aguish rigors, and was told, at last, that nothing could cure him but being cut in the perinæum, to which he had a serious objection; and instead of going to Edinburgh, as advised, returned from the country to London, and was recommended by the subject of Case No. 8 to go to Mr. Guthrie, with the determination to be cut on the inside of his urethra, if he pleased, but not on the outside. The operation was performed, after due preliminary examination, on the 27th of March, and a catheter introduced, which gave him great relief with respect to his water; it was followed, however, by some fever, but not sufficient to prevent his going to Mr. Guthrie's house after a few days. A swelling then formed at the anterior part of the scrotum, which was opened, but contained only matter, without any sign of urine. Pain supposed to be rheumatic, next affected the back part of the left shoulder, and was soon followed by swelling, without discoloration. As this was supposed to contain matter, it was punctured, on the 30th of April, by a very small trocar, and six ounces of good pus were allowed to run through it. The operation was repeated every second or third day, for three times, when the little opening was enlarged, and the discharge gradually ceased. A No. 12 silver sound was passed every other day, and he left London, doing it for himself, at the end of May, in health and spirits. This gentleman was fortunate in having his matter deposited first in the scrotum, and afterwards under the muscles of his back.

The division of a stricture from behind forwards, implies that it is passable by an instrument of moderate size, say a No. 4, 5, or 6, and that the operation is not consequently one of necessity but of choice, with the hope that it may lead to a permanent cure, which it is very likely to effect. In many cases of intractable strictures, I have found it advisable to puncture the fore-part, without attempting to divide the whole thickness of the stricture at once, and have thus been enabled in many instances to introduce an instrument which cut from the side and not from the point, thus depriving it of its most dangerous quality. The instrument I place before you was made more than twenty years ago, by Messrs. Philp and Whicker; it is one of several, having each a somewhat different inclination. The instrument is round, straight, and of equal size throughout unto the end, the under part of which forms a bulb or ledge sufficiently developed to catch against the stricture when passed through it, and then withdrawn until it meets with the check the inner side of the stricture occasions by catching against the ledge or bulb. The cutting part being then protruded on the under side by the pressure of the thumb on a spring, the instrument is to be drawn through the stricture, which it divides; the pressure of the thumb being removed, the cutting part returns into its sheath, or it may, if found necessary, be pushed forwards through the stricture, thus deepening and completing the cut already made, or even making another by the side of the first, if thought advisable. The operation thus simplified may be repeated if required with a larger instrument, until the wall of the urethra itself, as well as the stricture, are both completely divided, if it should so please the surgeon; a proceeding which appears to me to be of more than a doubtful nature. The error, when one is committed, lies in trying to do too much at once, for although an insufficient incision will not effect a cure, there is no difficulty in augmenting either its length or its depth, when the insufficiency is manifest. It is a point to be acquired by experience, and the surgeon will soon learn that the incision, however well made, is never equal to the width of the blade of the instrument, from the natural receding of the parts. It should extend from a little behind quite through the stricture, and about a line in front of it, and a ledge should not be left behind on which the point of a bougie can hitch. When the division of the stricture has been accomplished, a straight sound, very slightly conical at the point, should be passed through it, until the distention begins to give pain, when it should be withdrawn, to be re-introduced again next day; until by successive introductions, and if necessary by successive divisions, the thickened or hardened parts have been absorbed, and the canal becomes free.

The division of a stricture, whether done from behind forwards, or before backwards, gives rise in some persons, to a sympathetic fever, resembling ague, which may continue for several days; but the same thing takes place in many irritable habits from the mere introduction of a common bougie, and is an evil which cannot always be avoided by the greatest care or gentleness. I have known a hæmorrhage of a more serious nature follow, in the ablest hands, the introduction of a common silver or elastic catheter, than that which sometimes supervenes after the division of a stricture. If this should not cease, in due time, under the application of very cold or iced water, a full-sized bougie should be introduced into the bladder, and pressure made upon it at the part injured. When much force has been used, or the outer wall of the urethra has been too much implicated, an ecchymosis of the external parts is said to take place, although it has not occurred to me. Urine may be extravasated, matter may form externally, or be discharged in quantity from within. These are accidents it is proper to enumerate, and which may befal any one, although they do not often occur, and are not to be expected when the treatment is conducted with sufficient caution and judgment.

In whatever manner the urethra may be divided, whether for a stricture only, or for a fistula in perinæo, any and every operation may lead to the excitement of a fever resembling ague in its paroxysms, and to the formation of matter in different parts of the body in a similar manner to that which I believe I was the first to show did often happen after amputation. It is a misfortune which cannot be avoided, and he is fortunate in whom these depositions of matter occur in parts not essentially vital, as in Case 16.

CASE 17.-J. G----, aged thirty-one, has resided fourteen years in India, and has suffered from stricture during the whole of that time. "In 1838 a No. 8 could be passed into the stricture, but not into the bladder, which relieved me a little, but a discharge remained. In 1842 a No. 4 would not pass. In 1845 a No. 9 would go through the first obstruction, but not into the bladder. In 1849, being worse than ever, I placed myself under another surgeon, who succeeded in passing a No. 1 into the bladder, and at last a No. 9, but only with great pain and force, so that it could not be withdrawn, except by putting a purchase upon it to pull it out. A swelled testicle, and an abscess in the scrotum, followed this treatment, and a gleet has been present since 1838, with great irritation and suffering. In April, 1851, I applied to Mr. Guthrie, having come from India for this purpose. He passed a small 5 with difficulty, and stated that I had three strictures-one half an inch from the orifice, which felt like a ring; the second, immediately in front of the scrotum, which felt hard, like a cord, for the space of an inch, and a third, at the curve, which he called a natural obstruction, but against which for several years my bougie always stopped. Mr. Guthrie divided my second stricture from behind forwards, so as to admit a No. 8 with ease, and which removed at once all my sufferings. The first stricture was divided a few days afterwards, and a No 11 went into the bladder without difficulty, leaving me in a perfect state of bliss. I can now pass a No. 13, and think myself cured."

I have, Mr. President, selected these cases from a great number, because each proves a leading point; and from them I shall now draw such conclusions as they appear to admit, having far outrun the time you have been pleased to allot for this lecture.

Conclusions.—1. That a hard and elastic, or an intractable stricture is never permanently cured by dilatation, or by the application of caustic, although it may be materially relieved by the regular periodical use of a dilating instrument.

2. That the division of an old, hardened, or elastic stricture through the perinæum is not usually followed by a permanent cure, although it is always attended by immediate relief. The disease being apt to return unless a solid sound or catheter is occasionally passed to prevent it.

3. That the operation of dividing the perinæum and urethra in such cases is sometimes attended by severe hæmorrhages, by fever, and is occasionally followed by fistulous openings, giving rise to much inconvenience. 4. That such division does, in some instances, effect a permanent cure.

5. That the division of the urethra through the external parts should never be attempted in any portion of it anterior to the bulb, such operation not being necessary; for the narrowest stricture of the pendulous or moveable part may always be divided internally with much less comparative danger than by the external incision, inasmuch as the instrument can be guided through this part by the finger and thumb of the left hand of the surgeon with a certainty almost unerring.

6. That the stricture considered by all surgeons as the most important and difficult of cure—viz., at the termination of the bulbous portion of the urethra—may always be divided, when impassable, by a *straight* instrument, and in general more easily than by a *curved* one; the use of which is founded on the erroneous belief that the stricture is situated in the membranous part of the urethra, instead of being, as it is, anterior to it.

7. That the division of a stricture should, if possible, be effected by an instrument passed through it, and cutting from behind forwards, rather than from before backwards, although a combination of both methods will frequently be necessary to ensure success.

8. That the division of a stricture by these means will not always ensure a permanent cure if more than the mucous membrane is implicated, unless such parts be divided also.

9. That in cases of intractable stricture, the mucous membrane, the inner layer of involuntary muscle, and the elastic tissue external to it, should be divided, when the operation is done from within, but not the outer layer of muscular fibres, which should remain as a barrier between the stream of urine and the common integuments of the external parts—an accuracy of division not always to be attained: whence, perhaps, the difficulty of effecting a permanent cure.

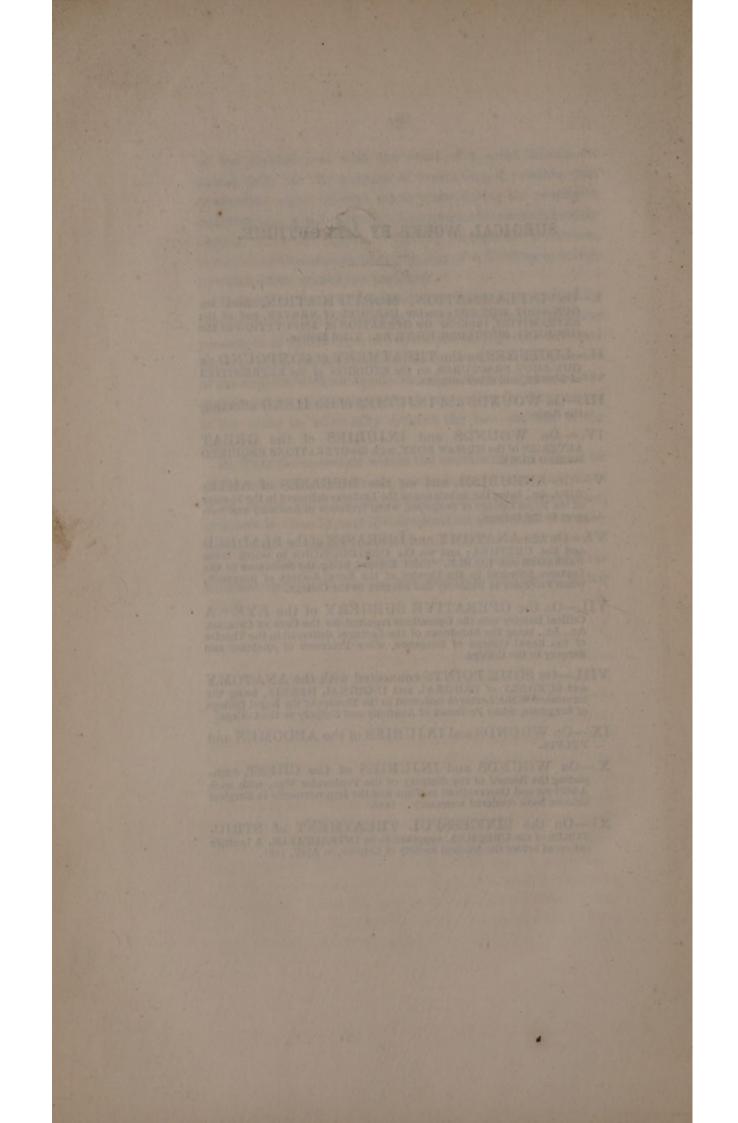
10. That when a permanent cure is effected in these cases, the divided elastic wall of the urethra is not re-united by a structure exactly similar to itself, but by common areolar tissue, rendering the part more dilatable under the pressure of the stream of urine; the formation of which dilatation can be aided during the progress of the cure by pressing on the divided part with the point of a solid instrument passed daily for the purpose of preventing, if possible, that contraction which always takes place during the process of cicatrization; a proceeding which cannot be advantageously adopted when the parts are divided through the perinæum, lest it should encourage the formation of a fistulous opening, to which there is always a tendency.

11. That in cases of intractable stricture accompanied by one or more fistulous openings in the perinæum, in young persons, or of middle age, the operation through the external parts, or along the urethra, may be resorted to at the pleasure of the surgeon with an equal chance of success, provided the division of the obstruction or bank preventing the free passage of the urine be effectually divided, the sine quâ non of the operation.

12. That the operation within the urethra should always be preferred in *elderly* persons, particularly if somewhat stout or fat, as less likely to create severe constitutional disturbance, as shown in Case 15; and if this operation should fail from any cause, it by no means interferes with the due performance of the other through the perinæum, which in serious cases then becomes imperative, as the last resource capable of giving relief.

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