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E. J. Shuttleworth
with the kind regards of his old
friend the author

ON

STRICTURE OF THE URETHRA.

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ON

STRICTURE OF THE URETHRA.

BY

HENRY SMITH, F.R.C.S.

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Dedication.

TO

WILLIAM FERGUSSON, ESQ., F.R.S.,

PROFESSOR OF SURGERY AT KING'S COLLEGE,
SURGEON TO KING'S COLLEGE HOSPITAL,
SURGEON EXTRAORDINARY TO THE QUEEN, ETC. ETC. ETC.

My dear Sir,

It has been my good fortune to be honoured by your friendship, and by a large share of your professional confidence, during a period which has witnessed your rapid elevation to a most eminent position amongst the Surgeons of the British Empire.

In your public and private practice, and in constant professional intercourse, you have afforded me the most valuable advantage of seeing every variety of surgical disease, and of acquiring that particular kind of information which cannot easily be obtained from books. It is with great pleasure that I now publicly acknowledge my appreciation of these advantages, and my gratitude for much kindness received at your hands, by dedicating to you the following pages.

The subject treated of is one of the utmost importance and interest, and has attracted the attention of some of

the most eminent Surgeons in this and other countries; and I trust you will consider that I have not thrown away the opportunities which have been afforded me of adding something towards simplifying the study and treatment of this grave and perplexing malady.

Permit me to subscribe myself, with much respect,

Your faithful Friend and old Pupil,

HENRY SMITH.

PREFACE.

THE attention of British Surgeons has been particularly directed to the subject of Stricture of the Urethra during the last few years; and certain methods of remedying the disease have been somewhat fully and warmly discussed.

The Author of the following pages has devoted to its consideration a large share of his attention. A great portion of time has been spent in following out the subject in its numerous details, and he has watched with especial interest the various expressions of opinion which have been more prominently brought before the Profession; and it has been his endeavour, by carefully watching and accurately recording cases which have fallen under his own observation, to arrive at some definite conclusions respecting the value of those remedial measures about which there has been so much difference of opinion.

Most of the works lately published on Stricture have been devoted to the consideration of some particular subject in connexion with this disease. Thus, the work of Professor Syme is chiefly the expression of the views of that eminent surgeon regarding the external section of the contracted urethra, together with a record of cases. That of Professor Lizars may perhaps be correctly designated, in the

main, a protest against the doctrines of Mr. Syme. The Lettsomian lectures of the late Mr. Guthrie and those of Mr. Hancock were devoted to some special points of interest ; the former, to the best mode of remedying intractable strictures—the latter, to the consideration of the anatomy and physiology of the urethra and bladder, and to the functional derangements of the canal. In the treatise, however, of Mr. Henry Thompson, the subject has been entered into in a comprehensive manner ; and the work of Mr. Wade, the colleague of the Author, must be looked upon as one of a thoroughly practical character, although it is well known that a large portion of it is devoted to the subject of caustics in the treatment of Stricture.

The Author therefore, taking these facts into consideration, will make no apology for bringing before the Profession the results of his own observations, in a treatise which is intended to be strictly practical, and almost entirely the exposition of his own views on the various points connected with the disease. It will be seen that the much-vexed questions of treatment by caustics, by perineal section, and by the external incision recommended by Mr. Syme, have been very fully entered into. Cases treated or observed by the Author, and illustrating each particular method, are recorded in the work ; and he trusts that the opportunities afforded him as pupil, as house-surgeon, and as visitor in the wards of King's College Hospital for ten years—by experience among the numerous patients of two large public institutions to which he has been successively

attached for eight years—by attending many cases in his own private practice, and by making use of the very valuable advantages offered to him in the capacity of private assistant to Mr. Fergusson for nearly ten years, will entitle his opinion to a favourable consideration.

The Author has not considered it necessary, in a treatise which is intended to be strictly practical, to dwell at any length upon the anatomy and physiology of the sexual organs; and it will be found that some points in connexion with the pathology of the disease have been but slightly noticed. These subjects will be found discussed fully in the essays already mentioned.

In acknowledging the sources from whence he has derived information, the Author must especially mention the writings of Civiale and Leroy, which are replete with instruction. He has also great pleasure in referring to the lectures of Mr. Hancock—to the treatise of Mr. Wade, from which he has gained many hints regarding the employment of potassa fusa—and to the elaborate work of Mr. Henry Thompson, which he has studied with great pleasure and profit. He has, lastly, to make his acknowledgments to Mr. Fergusson for permitting him to make use of the information afforded by numerous cases treated in the wards of King's College Hospital, and in his private practice.

14, Caroline Street, Bedford Square,

March, 1857.

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ON

STRICTURE OF THE URETHRA.

CHAPTER I.

ON THE ANATOMY OF THE URETHRA.

PRIOR to entering upon the consideration of the pathology and treatment of Stricture, it will be proper to describe briefly the structure and form of the urethra; for the first step towards a right knowledge of the disease and its treatment is a correct view of the anatomy of the part in which the affection is seated; and in no one instance of surgical disease is it more necessary to have a clear conception of the structure and relations of the parts, than when the practitioner is dealing with stricture of the urethra. Without this knowledge, he will be liable to commit grave errors.

Importance of knowing the anatomy of the urethra.

In considering the anatomy of the urethra, it is most desirable to divide the canal into *three* regions, because they are well determined by the structure of the tissues which surround each. These three regions consist of the *spongy*, the *membranous*, and *prostatic* portions.

Urethra divided into three regions.

The first or *spongy* portion extends from the meatus to the termination of the *bulb*, which is by some considered as a *fourth* region, and not improperly so, as its structure and relations in reference to surgical operations

Spongy portion.

are most important; but it is as well, perhaps, to consider the *bulb* as a continuation of the *spongy* portion.

This region is called spongy portion because it is principally formed or surrounded by an erectile tissue very similar in appearance to that of a sponge. The length of this part of the canal in the adult is from five and a half to six inches. It terminates in the *bulb*, which is an expansion only of the spongy tissue, and is situated in front of the triangular ligament or deep perineal fascia, which extends between the rami of the pubes and ischium. In the bulb, the dilatation of the spongy tissue is much more decided below than above.

Membranous portion.

The *membranous* portion of the urethra is that part of the canal situated between the bulb and prostate. It extends beneath the arch of the pubes, and penetrates the triangular ligament, which is divided into two layers, one of which passes backwards over the prostate and becomes continuous with its capsule, and the other is continued forwards over the bulb. This portion of canal is from three-fourths to one inch in length.

Prostatic portion.

The *prostatic* portion is situated between that last described and the neck of the bladder, and traverses the prostate gland, by which it is surrounded, being considerably nearer its upper than its inferior surface. In length it is about one inch or one inch and a quarter; although, from certain pathological changes which take place here, there must be a considerable variation.

Length of canal.

The average length of the whole canal is about eight inches—but upon this point anatomists and surgeons have differed. The most satisfactory method of ascertaining this point is to measure the canal on the living subject; and this can be effected by introducing a catheter,

and noticing the precise moment at which the urine escapes: the point in contact with the meatus is then marked on the stem, and the distance from this spot to the eye of the instrument gives the length of the canal. In this manner the late Mr. Briggs measured the urethra in sixty living subjects. In eight of these instances the length was under seven inches; in forty-five it was between seven and eight inches; and in the remainder it was eight and upwards: so that, according to him, the length averages from seven to eight inches.

Briggs' observations.

M. Leroy d'Etiolles examined in this manner one hundred individuals. He says—"The result obtained by making a hundred observations upon the living, by marking the point at which the urine began to pass through a gum-elastic sound—the penis being abandoned to itself—was, that the mean length of the urethra is eight inches."*

Leroy's observations.

Of course, the length of the canal will depend upon the stature of the man: in the tall person it will be above, and in the short man below the average. Thus, the same observer says—"If I have rarely met with the canal seven inches, it has very often happened to me to find it ten and eleven inches in length, and even more." In certain conditions the length will be increased. Thus, where the individual is very fat, the curve of the canal is increased, and its length rendered greater by the deposition of adipose tissue around the rectum and the neck of the bladder. In enlargement of the prostate gland, the canal is elongated in some instances to a very great extent.

The *diameter* of the urethra differs at various points.

Diameter of canal.

* Leroy *On Treatment of Stricture of Urethra*, p. 5.

At the meatus it is most narrow; the canal then expands in the fossa navicularis about six or seven lines backwards. It is then again slightly contracted, and very gradually enlarges as far as the bulb, where it becomes considerably dilated. It narrows again at the junction of the bulbous and membranous parts: in the middle of the latter portion it becomes more expanded till it reaches the anterior portion of the prostate, where it is again slightly contracted. In the centre of the prostate it is more dilated. And lastly, at the vesical extremity it becomes again contracted, where there is a round opening slightly raised.

Width at various points.

The narrowest points of the urethra are the meatus and the commencement of the membranous portion. At these situations the urethra measures about one-third of an inch or more. The widest and most dilatable parts are the bulb and the middle of the prostatic portion: in both these places the diameter is from six to seven lines. The width also differs according to age; for in advanced life the canal becomes more distensible; and Sir E. Home found that in two persons, respectively of eighty and of thirty years of age, there was a difference of at least a line at the several points measured.

The direction of the healthy urethral canal is as follows:—The penile or spongy portion, in the naturally flaccid state, is moveable, and inclines upwards towards the pubes, where it is fixed by the suspensory ligament and by the insertion of the crura penis. As it approaches this bone, the canal curves, and in this curved direction courses under the arch of the pubes, being firmly fixed by the deep perineal fascia, whilst that in the prostatic portion is continued almost directly upwards into the

bladder. Thus it is that, when the point of a catheter has entered the bladder of a patient whilst erect, the anterior extremity of the instrument is directed towards the ground. Or the direction of the canal may be considered from its point of departure from the bladder; and I cannot describe its course better than in the words of Dr. Hodgson, the author of an admirable treatise on the Prostate Gland:—"As it lies imbedded in the prostate, the urethra has a direction from the neck of the bladder downwards and forwards. This direction obtains in the immediately succeeding part of the membranous portion, while more anteriorly the membranous portion ascends a little. After passing the anterior layer of the triangular ligament, the urethra takes on a more confirmed ascending direction, being maintained for a short distance in that position by firm attachment of the bulb to the triangular ligament. More anteriorly, the urethra continues to ascend in front of the symphysis pubis, and finally drops down with the penis in the flaccid state of that organ. In this manner the whole course of the healthy urethra forms two curves; the one commencing at the neck of the bladder and terminating at the bulbous portion, having its concavity opposite the pubic arch; the other commencing with the bulbous portion and terminating at the external orifice, with the concavity directed towards the perinæum."*

Mucous membrane.

The entire urethra is lined by a *mucous membrane*, which is continued from the bladder, and terminates at the orifice of the urethra at the glans penis. It is smooth to the naked eye, and is very vascular. It is

* Hodgson *On the Prostate Gland*, p. 12.

united to the surrounding tissue by a delicate areolar or cellular texture, which is partly elastic and partly non-elastic. On the surface of the mucous membrane, throughout the whole extent of the urethra, with the exception of the prostatic portion, are seen numerous minute openings of the lacunæ or mucous glands, their orifices looking towards the meatus. About an inch from the meatus there is one, on the upper surface of the urethra, much larger than the rest: this is called the *lacuna magna*. In some pathological conditions these openings are much more developed than in the healthy state.

The membrane is composed of two distinct layers. The epithelium is of different character: in the anterior portion of the canal it is tesselated, whilst at the posterior part it is spheroidal. Near the bladder, the mucous membrane is found, on examination by the microscope, to be distinctly *rugous*, the rugæ being ordered in a longitudinal direction. These rugæ are of a fibrous appearance, and of a bluish tinge. There are no rugæ in the anterior portion. These rugæ are well supplied with capillary vessels, the loops themselves being most observable in the depressions, and not so distinct on the convex portions. In the prostatic portion the mucous membrane is not so smooth as in the membranous portion, and under the microscope it has a wavy and puckered appearance.

Microscopical appearance of mucous membrane.

In the *membranous* part of the urethra this texture is very smooth and vascular, and, on examination by the microscope, the epithelium is found to be less developed; and, indeed, this part is so vascular, that a distinct line of demarcation between the prostatic and

membranous portions may be seen under the microscope. Mr. Quekett was, I believe, the first to describe this appearance.

In the *spongy portion* the mucous membrane is smooth, soft, and glistening. By microscopical examination, there are not any rugæ seen in the anterior half of this portion; but just in front of the membranous part the rugæ are very distinct, and are disposed in a longitudinal direction.

Mucous membrane of prostate.

Connected with the mucous membrane are several other points of importance in the urethra. Thus, in the centre of the *prostatic portion* is an elevation termed the *veru montanum*, or caput gallinaginis: in the middle of this is an opening—the sinus pocularis—leading to a depression or cavity, into the sides of which open the two common ejaculatory ducts. The veru montanum is much more developed in some subjects than in others: in one case it extends almost to the membranous portion of the urethra, and ends in a bifurcation. It is a remarkable thing, that amongst the morbid phenomena which are observed in the parts behind a bad stricture, is a total degeneration of this prominent point in the prostate. On each side of the caput gallinaginis the ducts of the prostate gland open; they are in number about twenty. Sometimes, in certain diseased conditions of the prostate, the orifices of these ducts become widely dilated.

Submucous areolar tissue.

Externally placed to the proper mucous membrane is a layer containing elastic and non-elastic tissue, and it had been supposed by anatomists that there was no other element in it; but the researches of Mr. Hancock, of the Charing-cross Hospital, show that there is a dis-

Organic muscular fibres.

tinct set of organic or involuntary muscular fibres surrounding the canal of the urethra, and that this layer is connected to the mucous membrane by the areolar tissue, elastic and non-elastic. His microscopical researches have clearly indicated to him the correctness of his opinion. I cannot do better than quote a portion of his description.

Mr. Hancock's description.

"The outer layer of the muscular coat of the bladder passes forwards on the outside of the prostate gland, and laterally and inferiorly joins the fibres derived from the inner coat in front of the prostate gland, to assist in forming the organic muscular covering of the membranous portion of the urethra; whilst superiorly, or on the upper surface of the gland, these external longitudinal fibres are arranged in two or more bundles, which are attached, as Mr. Guthrie pointed out in the year 1830, to the pubes near its symphysis. From the front of the prostate the conjoined layer of organic fibres passes forwards to the bulb, investing the membranous portion of the urethra, covered by but distinct from the common muscles of the part, the latter being inorganic, voluntary, or striated, these being organic, and nucleated. Arrived, however, at the bulb, these two layers again part company, and extend forwards through the whole length of the spongy portion of the urethra, the internal layer running between the corpus spongiosum itself and the urethra, but separated from the latter by areolar tissue; the external lying on the outside of the corpus spongiosum, separating the proper spongy tissue from its fibrous investment. Upon reaching the anterior extremity of the urethra, these two layers again unite, and form a circular body

or band of organic muscular fibres, constituting that peculiar structure usually denominated *the lips of the urethra.*"*

Muscles of urethra.

The proper muscles of the urethra in close connexion with the canal are the *accelerator urinæ*, the *compressor urethræ*, and *levator ani*.

Accelerator urinæ.

The *accelerator urinæ* is a fan-shaped muscle, and, with the one of its opposite side, is spread over the bulbous part of the urethra: it, in fact, may be considered a single muscle, consisting of two symmetrical parts: it arises from the tendinous raphé of the perinæum, which connects it with the *transverse* and *sphincter ani* muscles; and from the tendinous raphé between the two sides of the muscle its fibres surround the bulb, and are joined above it by a strong aponeurosis. At its fore part on each side a slip passes over the sides of the corpus cavernosum of the penis to its dorsal surface, where it is inserted into a fascia which covers the vessels on the dorsum. A deeper layer of this muscle is described, but it is merely the fibres which cover the more prominent part of the bulb being overlaid by those contiguous to them.

Compressor urethræ.

The *compressor urethræ*, or Guthrie's muscle, encloses between its layers the membranous portion of the urethra, and is contained within the two lamellæ of the triangular ligament. It arises on either side by a narrow origin from the ramus of the pubes just above the tuberoses, then divides into two strata which enclose the membranous portion of the canal, joining in the median line the corresponding portions of the muscle of

Guthrie.

* Hancock *On Stricture*, p. 15.

the opposite side, and in some subjects by a distinct tendinous raphé. The lower fibres cover Cowper's glands, which are seated just below the membranous portion of the urethra.

Wilson. Mr. Wilson described two small muscles, arising each from a tendon affixed to the back part of the symphysis pubis, which spread out as they descend, and are placed one on each side of the urethra, blending with the other muscular structures.

Levator ani. The *levator ani* is an important muscle, forming, as it does, the floor of the pelvis, although only the anterior fibres are in relation with the urethra. It arises from the posterior surface of the os pubis near the symphysis, from the origin of division of the fascia into pelvic and obturator, and from the spinous process of the ischium. The fibres converge from this extensive origin, and descend to be inserted into the sides of the rectum, the tendinous raphé, and the os coccygis. The anterior fibres go from the pubes downwards on each side, and interlace with each other under the prostate and neck of the bladder. By this disposition of the anterior fibres, it is evident that they can exert important influence on the canal in certain pathological conditions.

The urethra is very vascular. The vessel which chiefly supplies the urethra, and which concerns the surgeon

Artery of bulb. most in connexion with stricture, is the *artery of the bulb*, which is a considerable branch of the internal pudic, and arising near the base of the triangular ligament, passes almost transversely inwards between its layers, and, about one inch from the base, reaches the bulb and enters the spongy tissue. It may, however, arise further back, it may be below the base of the

ligament: if more anteriorily, or from an accessory pudic, its position will be higher than the bulb. When near the urethra, a small branch passes down to Cowper's gland.

There are other vessels which are of great importance in the perinæum and penis, but they do not very much concern the surgeon in the treatment of stricture of the urethra. In making incisions through the perinæum, there is not so much bleeding as would be expected, if the cuts are made where they ought to be—viz., exactly in the mesial line.

Vein. There is a large *vein*, called the dorsal vein, of the penis, which commences by the rami from around the glans. There are at first *two* dorsal veins, one on each side: having received the blood from some veins of the corpus cavernosum of the penis, they proceed backwards, and, uniting into one trunk, pass through the sub-pubic ligament, then divide again into two branches, which descend obliquely along the side of the prostate and neck of the bladder: they here form a plexus with the branches of the vesical veins.

Rectum. An important part in connexion with the urethra is the *rectum*, which, in proceeding through the pelvis to the anus, has relations both with the urethra and the bladder; and it is most important for the surgeon in treating stricture to have a clear idea of this part. The last portion of the gut lies below the membranous and prostatic portions, the membranous portion of the urethra being about half an inch above it; the prostate being nearer. Its apex is, however, separated from the rectum by an interspace containing cellular tissue, whilst the inferior surface lies closely upon

the gut: this interval between the lowest extremity of the rectum and the urethra is an important one in a surgical point of view. The apex of the prostate is situated about one inch and a half from the verge of the anus, the base being distant from the same point about two inches and a half: behind this also the gut is in relation with that important part of the base of the bladder which is not covered by the peritonæum, and through which the opening is made in puncture of the viscus by the rectum.

CHAPTER II.

STRICTURE: ITS NATURE AND PATHOLOGY.

In considering stricture of the urethra, it is proper to include in this term only that condition of the canal in which a narrowing or contraction exists or is produced by causes which alter the calibre of the same. It has been customary hitherto to divide this malady into two distinct forms—viz., the permanent and the spasmodic stricture; and it will be well in the present essay to treat of each kind separately. The permanent is that which is most frequently met with, and most troublesome to remedy: moreover, it is that condition which is followed by most serious consequences: and therefore I shall commence this part of my subject with the consideration of permanent stricture.

Definition of stricture.

I shall not dwell upon the particular causes of stricture at present, but shall refer to them in another chapter. It is only necessary to state, *in limine*, that inflammation is in all, or nearly all cases, the actual process at work in the production of permanent stricture, and that the disease is the result of this inflammation.

In the greater number of instances it is underneath the mucous membrane, in the surrounding or connecting tissue, that the disease is seated: inflammation has become propagated to this texture, and lymph, the inflammatory product, has become deposited there, and

Stricture, the effect of adventitious deposit.

thus the calibre of the canal is encroached upon. It is upon the amount of lymph which has been thrown out that the extent of stricture depends. In the mildest form of the disease, there is a very slight thickening of the submucous tissue, so limited in its extent that the consequent encroachment upon the calibre of the canal appears as though it were produced by a mere thread. In the majority of cases this involves the whole circle of the canal, but in other more rare instances one side of it only is affected.

Stricture in its most limited extent.

In the next condition the extent of the stricture is increased, and it varies from the breadth of half a line to half an inch or more. On carefully examining such a preparation, laying open the canal from above or below, a distinct fibrous appearance will be noticed in the part affected ; and although the mucous membrane may be entire, a roughness which does not exist in the sound part of the canal will be appreciable to the touch, the surrounding tissue will be more or less condensed, and if the disease has been of long standing, and has been much neglected, the spongy tissue around the canal will be infiltrated with lymph, and the disease may involve one or two inches of the urethra.

Condition of mucous membrane.

In cases of stricture produced by thickening of the submucous tissue, the membrane itself may be entire, although it is altered in its appearance from the condensation of the parts beneath ; but in some instances it will be found not to be entire, but partially destroyed or completely eroded : in such a case, probably, ulceration has taken place. On examining such a preparation, there is seen a puckering, as it were, of the remains of the mucous membrane ; or if this is entirely

Valvular stricture.

gone, the submucous tissue is denser and more fibrous in its appearance. Sometimes a stricture is produced by a mere valve or thread of adventitious texture thrown across from one side of the canal to the other, allowing a small instrument to pass either above or below it.

Although for the most part stricture is produced by thickening of the mucous and submucous textures,—that is, the deposit is *outside* the lining of the canal,—the disease may consist in a deposit *upon* the mucous membrane. Mr. Hancock lately had the opportunity of examining the urethra in some who died with this disease, and he ascertained that the obstruction was caused by the deposit of an adventitious membrane upon the free surface of the mucous lining itself. I have not observed this myself at present; but even had not the evidence of Mr. Hancock proved that stricture is sometimes produced in this manner, analogy would lead us to believe that the effusion of a false membrane upon the inner surface of the canal was by no means an unlikely occurrence; for in the trachea and bronchi this takes place to a marked extent, and there is no reason why the same thing should not occur in the urethra after severe inflammation. It is not by any means improbable that this condition may have existed on occasions when myself and others have examined specimens, and has been overlooked; for Mr. Hancock had been unable to ascertain the exact seat of the deposit with the unaided eye, but was obliged to resort to the microscope before he could distinguish the adventitious membrane as different from the ordinary deposit forming stricture. Speaking of the appearance shown, Mr. Hancock ob-

Stricture from deposit on the mucous membrane.

Mr. Hancock's observations.

serves—"The membrane was straw-coloured, and for the most part adhered so firmly to the mucous membrane, that it was only by careful dissection we could separate the one from the other: indeed, so identified were the two, that had we remained content with a mere cursory or superficial examination, we might have imagined the morbid appearances to have depended upon thickening and puckering of the mucous membrane itself, rather than upon what actually obtained. It was only by the microscope that we could determine what was really the condition of parts. The existence of this false membrane was proved by some points of great interest; among others, that although this newly-deposited structure appeared to be invested by mucous membrane when examined by the naked eye, the investment, though smooth and shining, did not possess the actual organization of mucous membrane, but, when viewed through the microscope, presented more the character of condensed cellular tissue. It did not possess either villi or papillæ upon its free surface; it was not invested by epithelial scales; and, what was extremely interesting, as incontrovertibly proving the non-identity of this membrane with the proper mucous canal, we found that by carefully dissecting it away, we came down upon the layer of epithelial scales separating it, as it were, from the proper mucous membrane of the urethra."*

Varieties.

When a stricture has only recently been formed, there is no great condensation of the parts, and the obstruction readily yields on the application of mechanical

* Hancock *On the Urethra*, p. 76.

means; and thus it is that some surgeons have described one form as the *dilatable stricture;* but, in my opinion, the degree of dilatability depends, in great measure, upon the shortness of time the disease has existed, as well as upon the kind of treatment which is adopted; and for this reason I do not consider that we can with propriety treat of the dilatable stricture as a variety distinct from any other kind.

Simple dilatable stricture.

Quite in contrast with this, we find a stricture, *undilatable, hard,* and *callous.* This is a condition probably produced by very severe inflammation originally, by the lapse of time, and by the continual irritation which has been kept up in the diseased portion of the urethra by the contact of the urine. In such a case, not only is the mucous and submucous tissue the seat of disease, but the other textures surrounding the canal are implicated; and if the stricture be situated in the straight portion, the spongy tissue, which is naturally loose and dilatable, becomes infiltrated with the effused material, gets hardened and condensed, and by this means a form of disease of great intractability is produced. Such a stricture as this can be ascertained to exist by exploration of the external part of the canal alone; for, on running the finger along the spongy body, the induration at the seat of contraction will be easily felt, and if the disease is seated far back, or there is no great condensation of the surrounding parts, by passing a bougie or catheter down to the stricture a peculiar sensation of density and callousness is imparted to the hand. Generally speaking, there is not much sensibility attending these cases; nor is there a tendency to hemorrhage, unless considerable violence is used.

Hard, callous, undilatable stricture.

Hemorrhagic stricture.

There is however, a form of this disease by no means badly described as the *Hemorrhagic* Stricture. In such, there is always a tendency for bleeding to take place whenever a bougie is brought into contact with it, even most gently, and when there can have been no laceration of the mucous membrane. In some cases there is considerable irritability connected with this form of the disease; but frequently the bleeding is produced by a touch of the bougie without any pain being excited. Sometimes the bleeding is so profuse that it continues for many hours, or even days, before it becomes arrested. These strictures generally dilate easily, and are rapidly remedied.

Inflammatory stricture.

Under the name of *Inflammatory Stricture*, some surgeons have spoken of a form of the disease which, according to them, is and should be distinct; but it appears to me that there should not be any difference drawn between this and the more ordinary form of the affection, for in the majority of cases contraction of the canal is produced by inflammation of some kind or another. Perhaps the only distinction between the so-called inflammatory stricture and any other is in reference to the rapidity with which it occurs. A patient, for instance, may suffer acutely from gonorrhœa, and during the violence of the disease the product of inflammation may be deposited, and thus stricture may be speedily produced. Again, this species of stricture may be produced in consequence of injury having been done to the canal by foreign bodies—by a bougie or a lithotrity forceps. If violence is employed, inflammation of the mucous and submucous tissues takes place, and a narrowing of the canal ensues; but resolution of the inflammation may occur, and no appearance

of actual contraction be met with. In many of the cases of so-called inflammatory stricture, it is highly probable that mere irritability and spasm are the main elements in the affection.

Irritable and contractile stricture.

There is another variety of the disease which has of late been much talked of—viz., the *irritable* or *contractile* stricture. Mr. Syme has drawn particular attention to this form, characterizing it as a condition in which there is a strong tendency to re-contraction after the stricture has been partially dilated, and when the general system sympathizes acutely with the local mischief, as evidenced by the production of fever, rigors, &c. The term *resilient* is what Mr. Syme has applied to the condition of the canal. There is no doubt whatever that strictures of this nature are not unfrequently met with ; but it appears to me that the peculiarity in these cases depends chiefly upon the condition of the system and the temperament of the patient, and that the tendency to resiliency or re-contraction, after temporary dilatation, is merely a portion, as it were, of that irritability which is an attendant upon certain forms of stricture ; for there can be no difference in the character of the material which is deposited underneath the mucous membrane, and which forms the stricture itself. Still, it is not to be denied that there is a certain amount of distinction between mere *irritability* and *contractility ;* for although in the majority of cases the two are combined, it will every now and then happen that there is excessive local and general irritability when an instrument is passed through a stricture, and yet the marked tendency to contract which is sometimes observable does not at the same time obtain.

Impermeable stricture.

In all cases of stricture the canal is encroached upon ; and it is this narrowing that gives rise to the most urgent symptoms. At the first formation of the disease, the contraction is but slight ; but as time goes on, there is a tendency in the disease to get worse, and the urethra becomes more and more obstructed, and will only permit the urine to flow in a very diminished stream ; but it is rare for the urethra to become entirely closed, so as not to allow any water to pass, and to form a really *impermeable* stricture. Surgeons, in speaking of this form of the disease, have hitherto referred to impermeability as a condition in which an instrument, however small, cannot be made to pass ; and it has not been supposed that a stricture is often met with which does not allow any urine at all to flow through, although specimens are every now and then seen in which a portion of the urethra has become entirely obliterated. Sir C. Bell speaks of having seen such a specimen :—" I have lately examined the parts where the stricture had absolutely closed, so that not a drop of urine passed along the urethra. The bladder had been punctured, and the man lived for years discharging his urine by the puncture. Here it was curious to observe that the part of the urethra anterior to the total obstruction was wide or dilatable as in the natural state of the parts."*

A stricture may be impermeable to any instrument attempted to be passed during life ; but, nevertheless, there may in reality exist a channel sufficient for one to pass. This we have an opportunity of observing after death. A remarkable instance of this nature occurred

* Sir Charles Bell's *Letters on the Urethra*, p. 19.

under my own observation in 1850. An elderly gentleman had suffered from stricture for twenty years, and had been under the care of the first surgeons in London, and of late years no one had been able to get even the smallest catheter into the bladder: the whole of the urine passed by a fistulous opening, and at length the patient died worn out by his sufferings. I examined the parts after death, and found that there was a firm stricture involving the whole bulb, and with very great care I could pass a small probe through the natural passage; but false routes existed on either side, and I have no doubt that the point of an instrument constantly took the direction of these openings. Case.

In speaking of the rarity of those cases of stricture which are really and entirely impermeable to urine, I must except those very sad and happily comparatively unfrequent instances of perfect obliteration of a portion of the canal, the result of extravasation of urine and sloughing of the tissues in the perinæum. A few months since, I assisted Mr. Fergusson in performing an operation upon a young Indian officer who was suffering from this lamentable accident. More than two inches of the canal had been destroyed. Most fortunately, the course of the urethra was ultimately restored in this case.

As long as the stricture lasts, there is a disposition for the canal to become more and more contracted; and this is especially the case where the stricture is of that hard nature before spoken of, and particularly if the malady has been produced by an injury to the urethra, either from a blow or from a fracture of the bones of the pelvis: and we have only to call to mind the effects Disposition in stricture to contract.

which take place in a cicatrix from a burn, to understand how this increased contraction will obtain. Cicatrices are endowed with a force of contraction: although it is exercised in a slow manner, nevertheless it is constant; and in the instances of callous and traumatic stricture, there cannot be a doubt that the same thing takes place unless an opposing influence is exerted in the shape of continual dilatation by mechanical means.

Traumatic stricture.

I shall have occasion to speak more minutely of traumatic stricture in another chapter, and it will then be seen that this form is most obstinate and intractable. But of the ordinary kind of stricture—viz., that produced by gonorrhœa—that seated in the spongy portion is the most endowed with the power of contraction, consequently the most undilatable. Experience has over and over again taught me this. When two strictures exist—one at the anterior part of the canal, about two or three inches from the orifice, and the other at the bulbous or membranous part—it will generally be found that the latter dilates much more rapidly than the former, unless it has been produced by an injury to the urethra.

Spasmodic stricture.

Surgeons and pathologists have always spoken of two forms of stricture—viz., permanent and spasmodic; and it cannot be denied that it is proper to draw this distinction, although a too strict adherence to it has probably induced erroneous notions regarding the latter condition. To speak more correctly, the spasm which is so frequently observed is for the most part a mere symptom; for, in the majority of instances of so-called spasmodic stricture, there exists at the same time an

organic narrowing of the canal, and the spasmodic contraction is an additional element, the result of some accidental irritation, local or general.

Simple spasmodic stricture.

Nevertheless, it is not to be denied that a pure spasmodic contraction of the urethra may obtain without the existence of any permanent lesion ; and instances of this kind are most frequently observed in individuals who lead irregular lives, who indulge frequently in promiscuous intercourse, and who drink largely of wine and spirituous liquors. In such persons, the mucous membranes generally become irritable, especially those of the bladder and urethra; the urine is rendered unhealthy and depraved in its character ; a general irritability of the system is produced ; and on exposure to a debauch, a regular attack of spasmodic stricture may be brought about, without there being any actual change of structure in the canal. The surgeon can make himself certain of this by being able with ease to pass a full-sized instrument into the bladder, either during the attack or afterwards ; and sometimes he has the power of proving this by an examination of the parts after death. A case most remarkably illustrative of this occurred to myself in March, 1852.

Case.

Mr. M——, a gentleman, aged forty-five, of most irregular habits, came one morning into my consulting-room in a most dreadful condition : he was suffering intense agony. He no sooner came into the room, than he at once pulled down his trousers, called for a chamber utensil, and made repeated trials to pass water. These were accompanied by most agonizing pain, and the urine only came away in a few drops now and then, and this with the greatest efforts on the part of the patient : in fact, he appeared to me to be

more like a madman than a rational being. I attempted to pass a catheter, but his sufferings were so great that I was obliged to desist. I therefore sent him home, and as he had been drinking hard, ordered him to get into a warm bath, and to take a large dose of laudanum, by which he was relieved. This patient had had several such attacks after drinking. In a few days, I was enabled to pass a bougie of moderate size into his bladder, and the function of the urethra was restored. Not long afterwards, this gentleman died somewhat suddenly, and I examined his urethra. There was no organic stricture; but in the situation of the bulb, and about the neck of the bladder, there was excessive congestion of the mucous membrane.

Spasmodic stricture formerly attributable to action of perineal muscles.

This occurrence of spasmodic stricture without the existence of any organic disease has been by most surgeons attributed to the action of the muscles which surround the back portions of the urethra,—viz., the accelerator urinæ, the compressor urethræ, and the anterior fibres of the levator ani. The spasm has also been considered by some to depend upon some accidental irritation producing an increased flow of blood into the tissues of the urethra; or, as Mr. Harrison has lately strongly urged, to result from congestion of the parts, caused by the compressing action of the muscles upon the veins. Experience teaches us that in the majority of cases of spasmodic stricture, an instrument is obstructed at the bulb or membranous portion, where, indeed, the muscles above mentioned exert their action; and it is only reasonable to suppose that it is their spasmodic contractions which cause the condition in many instances. But it is occasionally noticed that the spasmodic action is par-

ticularly appreciable at the anterior portion of the canal, without the sphere of influence of the accelerator urinæ, and therefore it was somewhat difficult to account for the phenomena. This difficulty has now in a great measure been removed by the discovery that the urethra is muscular throughout: for it is clear that any portion of the canal may be spasmodically contracted by the muscular fibres which surround it when a sufficient exciting cause obtains, even though there should be no permanent thickening of the canal. And Mr. Hancock, in his lately-published work, has related some very interesting cases in which spasmodic stricture seemed to depend entirely upon the action of the organic muscular fibres of the urethra.

Now explained by action of organic muscles.

Nevertheless, by far the majority of cases of spasmodic stricture the surgeon meets with is where the condition is a mere accident engrafted, if I may so speak, upon an organic contraction of the urethra, of greater or less extent, when a sufficient cause of irritation has been in play. The attack, for instance, is brought about under the following circumstances:— A man has an organic stricture: he goes out to dinner or supper, and drinks a large quantity of wine or other stimulating beverage, and in the midst of his carousal, or soon after getting home, finds he is attacked with an urgent desire to pass water, and cannot emit any, or can only pass it drop by drop, and with excessive agony, and all the severe symptoms of retention come on. Or it may happen that a patient exposes himself to cold, perhaps gets intoxicated, and lies down upon the ground in the open air, and, on awaking, finds himself unable to micturate. Under either of these circumstances the

Spasmodic stricture mostly mixed with permanent stricture.

stricture, which was permeable a few hours before, becomes locked up by spasm and impermeable to urine, at least for a time.

Mode of production and exciting causes.

Spasm may be superadded to organic stricture by the application of any local irritation. Thus, the mere introduction of a bougie or catheter down to the face of the obstruction when the urethra is very sensitive, or its passage through the contracted part, will frequently bring on an attack. Every now and then, cases are met with in irritable subjects where any attempt to dilate a stricture is followed by severe spasmodic action; and, indeed, it is found impossible to go on with the treatment for a time.

Produced by cause acting at a distance.

Case.

Any cause of irritation applied at a distance will produce spasmodic stricture. Thus, I had a patient with two bad strictures—one situated at the meatus, the other at the bulb. On one occasion I applied some caustic to that at the orifice. This, in the course of an hour, produced spasm, which affected, not the anterior, but the posterior stricture, for he came back to me with retention; and on passing a bougie, I found it obstructed at the bulb. This fact shows that, in some instances at least, the spasm is produced by the action of the muscular fibres surrounding the perineal portion of the urethra. This is also confirmed by the circumstance that, in certain instances of irritable urethra and spermatorrhœa where no organic stricture exists, the bougie, however carefully and gently passed, is obstructed by spasm at the part of the canal within the sphere of action of these muscles, but not at any point in front, although the whole extent of the urethra may be exceedingly irritable. Now, if spasmodic stricture depended alone upon the

contraction of the organic muscular fibres, we should in such cases most surely find the bougie obstructed in the front portion of the canal much more frequently than we now observe to be the case.

Produced by contiguous irritation.

Spasmodic stricture may be produced by various other causes when there is no permanent contraction. Thus, for instance, I have seen spasm and retention of urine brought about by the proximity of a phlegmonous abscess in the glutæal region. Operations upon the rectum will produce it, in consequence of the contiguity of the urethra to the gut. Retention of urine is very frequently noticed as an effect of placing a ligature upon hemorrhoidal tumours.

Inflammation as a cause of spasmodic stricture.

As inflammation is the great originator of permanent, so, doubtless, does it produce spasmodic stricture. Thus it is that, in some violent attacks of gonorrhœa, we meet with partial or complete attacks of retention of urine: the excessive inflammation of the lining membrane, and the irritation of the urine coming in contact with it, are sufficient to cause the muscles to contract spasmodically.

Mental cause, &c.

It is well known that the influence of the mind will produce spasmodic action of the urethra; and there are certain cases of retention of urine where it is somewhat difficult to ascertain whether the condition should be looked upon as resulting from loss of power in the bladder itself, or dependent upon an irregular contraction of the muscles of the urethra. I allude to cases where retention of urine and all the symptoms of spasmodic stricture arise suddenly upon some severe injury, or after a surgical operation in a locality far removed from the urethra. I shall, in the chapter on the Treatment of Spasmodic Stricture and Retention of Urine,

have occasion to refer to this subject again; and having now described the varieties of spasmodic stricture, I shall at once proceed to the inquiry as to the seat of stricture.

SEAT OF STRICTURE.

Generally said to be most frequent in membranous portion.

Any portion of the urethra may become contracted; but experience teaches us that there are certain situations where stricture is met with more often than in others; and, as a general rule, it may be said that it is seated most frequently at the bend or perineal portion of the canal. And this fact has led many surgeons into the error of supposing that the *membranous* part was the most frequent seat of the disease; and I believe that most surgeons, if asked the question, would at once say that stricture was generally met with there. All authors agree in the statement that the disease is chiefly observed in the perineal portion; but men of eminence and observation have differed much with regard to the precise situation, whether behind or in front of the triangular ligament.

Author's statistics.

Having wished to obtain some more accurate information regarding the most frequent locality of stricture, I took the trouble to investigate the point by examining the morbid specimens of stricture in various museums; and, without examining the subject further, I shall give the results of my examination in a tabular form. The specimens are in the following museums:—

Bartholomew's	25	in number.
Cambridge	8	„
King's College	12	„
Hunterian	40	„
Total	85	

In the specimens at St. Bartholomew's, twenty-five in number, the seat of stricture is as follows :—

1. Centre of spongy portion.
2. Two inches from orifice.
3. Just in front of bulb.
4. Bulb and membranous part.
5. Three inches from orifice.
6. One inch in front of bulb.
7. Three inches in front of bulb.
8. Bulb and membranous part.
9. Bulb.
10. Bulb.
11. Bulb.
12. Front of bulb.
13. Front of bulb.
14. Membranous portion.
15. Bulb, and in front.
16. Bulb, and membranous portion.
17. Front of bulb.
18. Two inches from orifice.
19. Just in front of bulb.
20. Just in front of bulb.
21. Two inches and a half from orifice.
22. One at orifice, and just in front of bulb.
23. One at orifice, and just in front of bulb.
24. Just in front of bulb.
25. Just in front of bulb.

In the specimens at Cambridge, eight in number :—

1. Two inches from orifice.
2. One inch and a half from orifice.
3. Just in front of bulb.
4. One inch and a half in front of bulb.
5. Just in front of bulb.
6. In bulb.
7. Bulb and membranous portion.
8. Stricture throughout urethra.

In King's College, twelve in number :—

1. Near orifice.
2. In bulb.
3. In bulb and expansion across prostate.
4. In bulb.
5. In bulb.
6. Just in front of bulb.
7. In bulb.
8. In bulb and membranous part.
9. Middle of spongy portion.
10. Spongy portion.
11. In bulb.
12. In bulb.

In Hunterian Museum, forty in number :—

1. Middle of spongy portion.
2. Spongy and membranous part.
3. Just in front of bulb.
4. Just in front of bulb.
5. In bulb and in front.
6. In bulb.

7. Front of bulb and membranous part.
8. Membranous part.
9. Membranous part and bulb.
10. In bulb.
11. In bulb.
12. Middle of spongy portion.
13. Spongy portion.
14. Spongy portion.
15. Just in front of bulb.
16. Spongy portion.
17. Membranous portion.
18. Just in front of bulb.
19. Bulb and membranous portion.
20. Just in front of bulb.
21. Membranous and spongy portion.
22. In bulb.
23. Spongy portion.
24. In bulb.
25. In bulb.
26. Membranous portion.
27. In bulb.
28. Spongy portion.
29. Bulb and membranous portion.
30. Bulb and membranous portion.
31. Just in front of bulb.
32. Just in front of bulb.
33. Just in front of bulb.
34. In bulb.
35. Just in front of bulb.
36. In bulb and in front.
37. In bulb and membranous part.
38. Spongy portion.
39. In bulb.
40. Spongy portion.

From the above tables, it will be seen that the seat of stricture is found in the membranous portion in eighteen cases, less than one-fourth of the whole; and in all of these but four, the stricture involves the bulb as well. In seventeen instances, the stricture is situated in some part of the straight or spongy portion, from the orifice to within an inch of the bulb; whilst in fifty of the specimens the disease is situated either in the bulb itself, or just in front of it. In only one instance is there stricture in the prostatic portion, and that is in the shape of a broad membranous expansion. Out of all these, the stricture is at the orifice in three cases only.

Results.

According to this, then, it will be seen that stricture is much more frequently met with in the bulb, or just in front of it; that it is found about equally in the mem-

branous portion, and in the cavernous or spongy portion, at varied distances between the orifice and an inch in front of bulb; that it occurs comparatively rarely at the orifice, and but seldom in the prostatic portion.

These observations tally also with my experience on the living subject. In rare instances, the whole length of the canal is contracted, not apparently from any deposition of lymph, but from a wasting of the spongy tissue, and a falling in of the walls of the canal.

Stricture at orifice.

In contraction of the meatus, it frequently happens that it is the result merely of previous ulceration and cicatrization of the lips of the orifice. Sometimes, however, a fold of membrane or a thread-like band of tissue is found stretching across the urethra just behind the meatus.

Number of strictures.

It is by no means an unusual thing to meet with more than one stricture in the urethra. I do not recollect ever meeting with more than one case in the living subject where more than three decided strictures existed. John Hunter relates having seen *six* in the urethra. It is extremely frequent to meet with two strictures at the same time; and, generally speaking, when there is an obstruction near the orifice, there will be another encountered further down.

EFFECTS OF STRICTURE.

In considering the pathology and nature of stricture, we must not stop short with the malady itself, but must look at the effects which are produced by the disease; for it is the pathological changes brought about in con-

sequence of it which render stricture so formidable, and the treatment of it so troublesome.

Bearing in mind the great importance of the functions of the urethra; that it serves as a conduit for one of the chief excretions from the body, conveys the seminal fluid, and is constantly called into play; that immediately behind the canal is situated the viscus in which the urine is contained before expulsion; and, moreover, that through this viscus it is in immediate connexion with the organs which secrete this fluid, and with the canals which permit of its flow from them into the bladder,—we shall be able to appreciate the mischief which is liable to be produced by a continued obstruction in this canal: and when it is borne in mind how easily the system at large sympathizes with a deviation of function in any chief organ, and how acutely it feels the retention of any excretion, it will be easy to understand how it is that the effects of stricture of the urethra are looked upon as of special interest and importance. It is mainly upon the parts behind that these are observed, and I shall consider them in order.

EFFECTS UPON THE CANAL ITSELF.

Effects on the canal in front.

The canal in front of a stricture is seldom affected to any extent, unless inflammation of the mucous membrane has been set up about the stricture from any cause; and in that case the part in front may be found inflamed. In very rare instances it is found dilated. It is in the canal *behind* the stricture that more decided changes are met with—just, indeed, as we should expect. The consequence of the obstruction of a tight and long

persisting stricture is that the urine is arrested. Even if it can flow partially, some portion remains behind, and the muscular power of the bladder constantly exerts itself to drive it forwards. Thus, by degrees, the canal loses its elasticity, becomes dilated, until after the lapse of time a pouch may be formed in which the urine becomes lodged. This pouch in some instances may be felt by placing the finger in the rectum. It is, however, only in long-continued and very tight obstructions that so great distension of the urethra behind the stricture is met with; in the milder forms of the disease this portion of the canal is only dilated to about one-third or one-half more than its natural size, and in some cases there is no dilatation whatever. Dilatation of the canal behind a stricture has been looked upon by some as a condition which almost necessarily obtains; but an examination of numerous specimens has convinced me that it is by no means of frequent occurrence, and that in many instances of obstinate stricture there is no dilatation. The late Mr. Guthrie, in his Lectures on Stricture, particularly alluded to this mistake of the older authors in supposing that the canal behind the stricture was necessarily dilated. He says—"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

Effects on the canal behind.

Dilatation not always present.

Mr. Guthrie's remarks.

from a few isolated facts, and believing an accidental dilatation to be one of frequent occurrence."*

In some instances, the dilatation of the part behind the stricture is so marked, that the surgeon, desirous of puncturing the canal for the relief of retention, may take this swelling as his guide after the superjacent textures have been divided. Sometimes it happens that a small calculus is found to have stuck in the canal behind the stricture, and to have formed for itself a pouch which has gradually enlarged. Mr. Guthrie mentions having dissected three specimens, where a small calculus was found in each, impacted in the posterior part of the stricture, and the canal was dilated to the size of a small orange. In a further chapter, whilst speaking of the treatment of stricture at the meatus, I shall mention an instance where a stone weighing more than half an ounce had become imbedded in the urethra behind a natural contraction, and had dilated the canal to a great degree. Besides dilatation, ulceration and destruction of the mucous membrane, to a greater or less extent, will be observed behind the stricture; in some instances so much so, that it will be difficult to recognise in a recent subject the continuation of the canal.

Calculus impacted behind stricture.

Ulceration of urethra.

In many of the instances where death has resulted from the violence of the disease, abscess will be found involving the parts behind. This is more frequently observed in the bulb and in the membranous portion. There may either be a single abscess, or several pouches containing matter. When inflammation terminating in

Effects on prostate gland.

* Guthrie's published *Lettsomian Lectures*, p. 27.

suppuration has ensued from stricture, the prostate gland does not escape, but its substance becomes affected, and one or more collections of matter are found here; and when the mischief has been great, the part becomes converted into a pultaceous mass, and the tissue of the gland cannot be recognised, disorganized as the textures are.

Perineal fistula.

Fistulous openings, in connexion with the canal, are frequently seen as the result of stricture in those who die from the disease; and although I shall have to speak more fully of their condition whilst considering the treatment of the disease, it will be well to dwell on it here somewhat. On examining a preparation of stricture complicated with fistula, it will be found that an opening exists immediately in connexion with the stricture: most generally it is behind the contracted part, sometimes actually involving the part. It is a very rare thing to see a fistulous communication with the canal in front of the stricture. In one specimen I have seen a well-marked instance of it; it is marked No. 928 in the Museum of King's College. The opening itself in connexion with the canal is generally limited in extent, sometimes not being larger than a pin's head, in other cases being as large as a pea. In one instance the orifice is situated quite in the centre of the canal, whilst in the greater number of instances it is more to one side than the other. Although in the majority there is only one opening into the urethra, it will be seen that there are several tracts in communication with the external parts: these open either upon the skin of the scrotum, or in the centre of the perineum.

Formed in two ways.

These fistulous openings are produced in two ways.

Sometimes an abscess is formed external to the canal; this enlarges by degrees, presses upon the urethra, and at length opens into it. Afterwards the abscess bursts outwardly, or is cut into by the surgeon : by this means a communication is formed with the urethra and the external parts, the urine escapes through the opening in the canal whenever the bladder contracts, constant irritation is kept up, fresh sinuses are formed, every now and then new abscesses are produced, and in this way the fistulous opening is prevented from healing. The other method in which the same condition is produced is as follows :—The urethra behind the stricture ulcerates ; urine escapes from the canal, becomes diffused into the loose cellular tissue of the perineum and scrotum ; great inflammation is produced followed by suppuration ; and, unless measures are quickly taken to evacuate the matters diffused, death may ensue. But if the parts are incised, and the irritating fluids are let out, the morbid actions cease. Nevertheless, the stricture not being removed, the urine still escapes from the opening in the canal, continues trickling through the tissues of the perineum, and thus a communication is kept up between the urethra and the external parts, and fistulæ are formed.

Calcareous deposits behind stricture.

Another result of stricture, and one often seen on post-mortem examination, is a quantity of calcareous deposit lining the mucous membrane of the canal behind the stricture. This is generally composed of phosphates, and is probably the consequence of the urine remaining for a time in the dilated portion of the canal, and becoming decomposed and alkaline. Sometimes

numerous small, round, brownish calculi are found in the dilated ducts of the prostate.

Sometimes the walls of a portion of the canal will be entirely destroyed by ulceration or sloughing which has taken place behind a stricture. Thus, in a specimen in the Hunterian Museum, marked 2456, there is an immense dilatation of the membranous portion of the urethra behind a stricture, and its upper wall is completely destroyed. Amongst other appearances which are observed behind a stricture, is a total degeneration of the caput gallinaginis. This is noticed in several of the preparations in the Hunterian Museum. Enlargement of the prostate gland is said to be a consequence of stricture.

Effects on the bladder.

The *bladder* is that organ which feels most severely the effects of a persistent obstruction in its excretory canal. It is well known that, when an organ is called upon to exert increased action day by day, it increases in size, and is thus for a time rendered more fit for the purpose of overcoming any obstruction which calls for this double duty. This is eminently observable in the case of the bladder when there is a stricture of the urethra. This viscus is, in the healthy condition, endowed with a sufficient amount of irritability and power to expel the contents by the medium of its muscular coat: the necessary contractions are produced without giving pain. But if only a temporary obstruction exists in the urethra, the bladder becomes filled and irritated to an excessive degree; its contractions become violent, irregular, and painful, and only cease when the cause is removed. It is not difficult then to understand that, when a continued

Increased action of this viscus.

obstruction exists in front of this viscus, its functions must be rendered abnormal and its structure impaired : it has a greater call upon it—has to struggle, as it were, against the obstacle in front ; the consequence is, that its walls become thickened. If the stricture has not been of long standing and is not very tight, the hypertrophy is only limited ; but if the malady has lasted for years, and has not been remedied, the walls of the bladder may be hypertrophied to the extent of a quarter and half an inch in thickness. This increase is chiefly marked in the muscular coat. On careful examination of a fresh specimen in such a case, the fibres are more like those of the deltoid than those of involuntary muscular tissue.

Coats much thickened.

These enlarged fibres protrude internally, and, by the mucous membrane sinking in between these protrusions, sacs are formed, in which calculi are sometimes found. The mucous membrane itself, in some cases, becomes very much thickened ; and in recent specimens especially, where inflammation had been present, it is found highly congested, of a dark chocolate colour, and, in very aggravated cases, portions of it are destroyed, and seen hanging in flocculent clusters into the cavity of the bladder. In some of these instances the cavity of the bladder remains of its normal size ; but in others, the organ, much hypertrophied, is found to be considerably contracted. This increase in size of the coats of the bladder is almost always seen accompanying stricture of long standing ; and an examination of the specimens in

Constant occurrence.

the various museums shows how constant it is. In nearly all the specimens in the Hunterian Museum where the bladder is preserved, hypertrophy of the

viscus is noticeable: in several of the specimens the thickness of the walls is enormous.

Effect on ureter.

The effect of a stricture on the ureters is very remarkable. In the Museum of the College of Surgeons is a specimen, marked 2540, where the ureter is dilated to the size of a portion of small intestine, in consequence of a stricture of the urethra at the membranous portion; and in the preparation marked 2542 the right ureter is considerably dilated, and formed into a sort of pouch, as large as a walnut, by the side of the bladder. It is not easy to account for the circumstance of one ureter being so much more dilated than the other. The effect of stricture is exerted still further back—the *kidneys* become altered in their appearance and structure. On examining the kidneys of a patient who has died recently from the effects of stricture which has existed long, they will be found congested and inflamed; and in some instances the pelvis is dilated, and pus is observed within it. In rare cases the substance of the kidney itself is wasted away, and nothing is left of it but a mere shell. In the Museum of the Middlesex Hospital, and also in the Hunterian Museum, is a preparation where, in addition to the ureter being enormously distended, there is complete destruction of the cortical substance of the kidney.

Effects on kidneys.

On the system at large.

I have now mentioned most of the effects of stricture as perceptible on the parts behind the urethra; and it has been seen that the disease, independent of the immediate symptoms and inconveniences attending it, produces most severe disorders in those parts which are immediately in connexion with the canal, and that these pathological changes increase in proportion with

the obstinacy and persistence of the obstruction. But the mischief does not stop here ; for, as the malady increases, its effects are by degrees exerted upon the general system, and all the important functions of the body become impaired. As the urine is continually obstructed, it accumulates in the bladder, and becomes decomposed ; the kidneys are changed from their integrity, do not eliminate the component parts of the urine from the blood in sufficient force, and thus the blood itself becomes, as it were poisoned; the patient gets into an irritable condition, becomes thin, loses his appetite, and being at the same time constantly tormented with the desire of making water, and harassed by the pain attending it, he loses his sleep, and soon becomes an object of the greatest commiseration. There is now an increased liability to congestion of the internal organs, and, above all, there is a tendency for the brain to become affected ; and when death does ensue from the effects of stricture, the mode of dying is not unfrequently by coma. It is therefore from the effects which are produced by neglected and long-continued stricture that this disease is in reality so formidable, and so energetically calls for proper treatment at the outset.

Impaired strength and nutrition.

Congestion of internal organs.

The effects of stricture are seen in other parts, and certain disorders are produced which prove very troublesome. Thus, through the medium of the vesiculæ seminales, the irritation of the urethra is propagated along the spermatic cord to the testis, and inflammation and enlargement of that organ takes place. It is most important to bear this in mind when treating disease of the testis ; for it will happen that all remedies fail, and

Effect upon the testicle.

that the enlargement only disappears upon dilating a stricture. A most instructive case of this nature was under my care in 1848, in the person of a young gentleman who had a severe attack of orchitis, which was followed by chronic enlargement of the testis. The acute symptoms were removed by leeches; but afterwards the testicle remained large and hard, although pressure was most carefully applied. After attending this patient for some time without benefiting him, I remembered that on a previous occasion he had been under my care with stricture, and it struck me that the canal might have become contracted again, and that thus the enlargement of the testicle might be kept up. I requested permission to examine his urethra, and on doing so found that the stricture had returned. I gradually dilated the canal, and *pari passu* with the progressive dilatation, the testis diminished in size and soon got sound.

Case.

Another result of stricture is enlargement of the veins of the rectum. When there is very great difficulty in passing water, the patient necessarily strains very much; and if this constantly occurs, pressure is exerted upon the hemorrhoidal veins, varicose enlargement of them ensues, and in very severe instances we see prolapsus of the gut: indeed, this condition is one of the most troublesome concomitants of severe stricture, as the gut falls every time the patient attempts to make water.

Effects upon veins of rectum.

Prolapsus ani.

The most serious consequence, however, of stricture is the giving way of the canal behind. This happens when there is total obstruction, and when the patient, being in horrible distress from inability to pass his water,

Rupture of urethra.

makes violent attempts to do so. The effect is, that the canal gives way behind the obstruction, infiltration of urine takes place, it becomes disseminated through the loose cellular tissue of the perineum and scrotum, and all those terrible effects are produced which will be dwelt upon hereafter.

CHAPTER III.

SYMPTOMS AND CAUSES OF STRICTURE.

As the urethral canal is constructed for the purpose of providing for the escape of so important an excretion as the urine, and as the reservoir in which this is retained prior to its withdrawal from the body is in close connexion with the urethra, it follows as a necessary consequence, that when the canal is obstructed, the symptoms will not only resemble each other in individual cases, but will in the main be referred to the act of micturition; and it will be found that they will generally correspond with the extent of contraction which has taken place, and with the duration of the disease. As a general rule, it may be stated that the stream of water becomes smaller as the canal gets more contracted.

Symptoms chiefly referred to the act of micturition.

When the urethra is in a perfectly healthy state, the urine is passed in a full, unbroken stream of considerable volume, and even the last drops of urine are expelled without any particular exertion on the part of the individual: but when the canal becomes contracted, even in a small degree, the patient feels that he is unable to expel the whole amount of his water: his attention is perhaps first called to his complaint, because he feels a difficulty in expelling the *last* drops of urine. This is one of the earliest signs of stricture, and may exist for some time without the patient having his notice particularly drawn to the condition of his urinary apparatus.

Impaired power of expelling last drops of urine.

Form of stream altered.

The next symptom is an *alteration in the form of the stream*, and is an important and truthful one, more especially if it persists whenever micturition is effected. In the early stage it is only slightly twisted, or divided into two portions: at the same time, there is a diminution in the size of it, and the patient feels that he is not able to pass it with his customary freedom. As the disease advances, those symptoms which mark its commencement become more decided, and others which have not yet been noticed become more evident.

Pain attending micturition.

Pain is experienced with the act of micturition, and the desire of making water is more frequent. The patient finds that, instead of being able to pass through the whole night without getting out of bed, he is obliged to rise once or twice during that period; and in the day-time the calls are much more frequent, and he is obliged to use greater efforts to empty the bladder. As the urethra becomes more contracted, the symptoms before noticed are aggravated, and referred as much to the

Irritability of bladder.

bladder as to the urethra itself, the desire to pass water is more urgent, and almost constantly harasses the patient, who is obliged generally to rise three or four times in the night for the purpose of relieving himself. Pain is experienced in a great degree if the desire for micturition is not accomplished, and the patient is annoyed more or less during the whole act, which is accompanied with great straining. The pain is felt above the pubes; and in the perineal region, in some instances, it shoots along the urethra. The urine comes away at first in interrupted jets, and then, when it is passed, the stream is either very thin, more or less twisted, perhaps completely bifurcated. By degrees,

this alteration in the stream becomes the most marked symptom, and indeed the one by which both the patient and surgeon is best able to judge of the nature of the contraction; for when the stricture almost entirely closes up the canal, the urine comes away only in drops, and then even with much forcing; and it will not unfrequently be noticed by the patient that his urine dribbles away from him when he is asleep. This dribbling, when the patient is lying still, or in a state of unconsciousness, is a most significant symptom, and generally drives him to consult some one, even if he has paid no attention before to his malady. It shows that the bladder is beginning to lose its tone, and has become so distended that its proper irritability is being destroyed. This symptom may be looked upon as one of great gravity; and if it does exist, the surgeon may make up his mind that he has to deal with a very bad stricture. It is in this state of matters that anything which induces general or local irritation may bring on an attack of retention of urine; and it is when the contraction is so narrow, as must be the case when this symptom exists, that during one of the strong efforts to pass water, rupture of the urethra takes place, and all its bad consequences ensue.

Stream almost entirely suspended.

Incontinence of urine.

Most important symptom.

In addition to these manifestations, there are other symptoms which, in severe cases more especially, arrest the attention of those who labour under this malady. *Pain*, which in the earlier stages may have been restricted to the region of the bladder and perinæum, is felt in other parts. During the attempts at micturition, shooting pains are experienced down the inner side of the thighs; and there is also a constant dragging

Sympathetic pains.

sensation in the loins. This is generally only observable when the stricture is very bad, and when it has been of long standing. Another symptom, or rather accompaniment of stricture, must not be overlooked, as it is important in more than one point of view: this is the discharge which takes place. In some cases, and those of an aggravated nature, there may be none, but in a great number of instances there is a discharge of some sort or other which is alone sufficient to arouse the attention of the individual who labours under the disease. In some cases, it is a very thin fluid, simulating gleet, or it may be of a thicker nature; and it may be of such a colour as to lead patient and surgeon to believe that gonorrhœa exists. It will happen that a patient has recently had gonorrhœa, that stricture has quickly supervened, and that the specific discharge has never totally ceased, although the more severe and striking signs of the gonorrhœa have departed; but in others there can be little doubt that the changes which have ensued from the contraction of the urethra itself will cause a discharge more or less profuse; and these changes may take place either in the urethra or in the bladder. It is extremely important to bear this in mind in the treatment of urino-genital diseases; for in the one case the discharge may be of such a nature as to lead the patient or surgeon to suppose that a gonorrhœa exists, or that there is a serious disease of the bladder, whilst it is in reality owing to a bad stricture. When this is remedied, the discharge will cease.—The following case illustrates these remarks:—A gentleman, living in Suffolk, aged twenty-seven, applied to me in June, 1848. He stated that he had had gonorrhœa several

Discharge from urethra.

Sometimes very abundant and purulent.

Case.

times, and that two years previously he had been treated for stricture by a surgeon, who said he had cured him. About twelve months after this he got married: a discharge appeared, and increased. He again applied to his surgeon, who told him he had gonorrhœa; but this the patient denied, as he had had no connexion with any one excepting his wife. He took anti-gonorrhœa remedies, but they did him no good, and consequently he applied to me. On examination, I found that there was a profuse discharge of thick purulent fluid, exactly resembling that of gonorrhœa; but he distinctly denied having put himself in the way of catching this disease since marriage. I therefore asked him to allow me to examine his urethra, and found a tight and irritable stricture, about five inches from the orifice. I desired him to attend regularly to have a catheter passed; and in the course of a few weeks I dilated the stricture, and the thick purulent discharge gradually ceased.

As in irritation or inflammation of the mucous membrane of other parts there is an exaltation of the amount of natural secretion, so in like manner, when stricture of the urethra has lasted so long as to induce irritation of the parts behind it, there will be the same increase in the secretion of mucus; and in some instances I have witnessed this in a remarkable degree. In such the patient will describe the sediment which takes place to be *just like an oyster*. This, in fact, is mucus which has been discharged, and which, after settling in the vessel, has become inspissated. When this is observed, and when it is dependent only upon the contracted state of the urethra, it may be set down that the stricture is

Great mucous discharge.

Leroy's case.

very narrow, and that the disease has lasted long. M. Leroy has drawn particular attention to this "secrétion de mucosités plastiques," and gives an account of a patient who, prior to his being treated for stricture, was troubled with this thick mucous discharge in such quantities that he was obliged to be constantly upon a chair pierced with a hole—"M—— ne pouvait pas vivre que sur la chaise percée;" but all this went away as soon as the urethra was fully dilated.

Condition of urine altered.

The *urine* will be much altered in consequence of the persistence of stricture; and although this alteration must rather be looked upon as one of the *effects* of stricture, still it presents itself as one of the *symptoms* of the disease. If the stricture is a bad one, it rarely happens but that the state of the urine will be more or less altered. In the less severe cases it is cloudy; and when allowed to stand for any time, deposits a greater amount of mucus than is natural. In the more advanced stages, it will be found to be thick and cloudy as it is passed; and on microscopical examination, a large quantity of epithelial scales and pus globules will be seen.

Bloody discharge.

In certain cases, also, blood is passed, although it is not often noticed. In one remarkable case which came under my notice, and which indeed was chiefly of a spasmodic nature, blood was passed in a clotted state; and this always gave relief to the symptoms.

As in a case of severe stricture the patient is unable to empty the bladder entirely, some urine will remain in it, and thus not only will a change take place in its physical, but also in its chemical, characters: it becomes decomposed, alkaline, and offensive to the smell. The fact of this chemical change taking place teaches the

surgeon the necessity of examining the urine in every case of bad stricture.

It cannot be a matter of surprise that, with this altered and alkaline condition of urine, not only calcareous deposits in the shape of sand and small particles form, but sometimes a stone in the bladder of considerable size is met with. Under such circumstances the symptoms will be exceedingly severe, the unhealthy condition of the urine will be greatly enhanced, the bladder becomes excessively irritable, and it will be remarked by an attentive observer that the patient complains most bitterly just as he is expelling with difficulty the last drops of urine. When this latter symptom is noticed, together with the want of relief from ordinary medical and surgical treatment, the existence of stone should be suspected, and it is necessary to put a sound into the bladder. I attended a medical gentleman some little time ago who had had bad stricture for many years. His sufferings were exceedingly acute when he consulted me, and I particularly noticed the symptom alluded to; but he had always had such excessive sensitiveness with his urethra, and he was so averse to the employment of instruments otherwise than with his own hand, that I, in common with other surgeons, did not suspect stone. However, on examination, a calculus was found, and the patient had to be subjected to lithotomy.

Case.

Most of the symptoms above alluded to have reference to and depend upon the obstruction to micturition. It cannot happen but that the other functions enjoyed by the urino-genital organs should be interfered with. When a stricture is first formed in the

Impairment of the generative function.

urethra, there may be no difference in the condition of the generative function; but as the canal gets more contracted, there will be a tendency to erections and nocturnal pollutions, which will become aggravated as the disease increases. It is not until the stricture has become very tight that there is much perceptible obstruction to the seminal ejaculation. In bad cases, however, the individual experiences a distinct interference with this function, consisting in incomplete erections, and an emission of the semen, without that vigour which obtains when the parts are in a perfectly healthy condition; and in very extreme cases the greater portion of the seminal fluid will be obstructed. This is, however, a rare occurrence; for even when there is a stricture impassable to instruments, there may be no great impediment to the emission of the seminal fluid,—not sufficient, at least, to prevent conception from taking place.

I have already considered the effects of stricture upon the general economy; and with reference to the main symptom or sign of a stricture—viz., that afforded by exploration of the urethra—I shall consider that in a subsequent chapter, and shall now proceed to the

CAUSES OF STRICTURE.

Gonorrhœa the chief cause.

The most fertile cause of stricture—and here I am speaking of permanent stricture—is undoubtedly gonorrhœal inflammation. It will be found, by careful examination of those patients who come under our notice, that in almost all the instances where the disease has not been produced by injury, there has been a previous

attack of gonorrhœa; and in a great number there have either been several attacks, or the disease has been prolonged. It is, indeed, rare to meet with a patient having organic stricture who has not at one time or other suffered with an urethral discharge. As, indeed, all the constitutional disorder which does not confine its ravages to the original recipient, but is transmitted by the parent to his offspring, is the penalty paid by him who contracts primary syphilis; so, in like manner, must stricture of the urethra and its serious consequences be looked upon as the physical punishment to be endured by many of those who have contracted gonorrhœa.

Objections to this view.

Some surgeons have, indeed, objected to the doctrine that stricture is caused by gonorrhœa, because, they say, one-half at least of the male population in a large city have laboured some time or other under an attack of gonorrhœa; and consequently, if this disease did cause it, we should find it much more frequent than it now is. This is false reasoning; for it is by no means to be assumed that, because stricture should be produced by gonorrhœa in a large proportion of cases, the whole or even a greater portion of persons who have had gonorrhœa should get stricture. Its occurrence will depend, in great measure, upon the susceptibility of the patient and the irritability of the urethra itself. The nature and duration of the attack of gonorrhœa must also influence the formation of stricture. It would seem, *à priori*, that the more acute and violent the attack is, so would the liability of the formation of stricture be greater; but this does not by any means follow, as the most intense attack of gonorrhœa is often experienced, and yet no trouble is afterwards felt by the patient.

Stricture is more likely to follow an attack of gonorrhœa which has lasted over a long time and resisted the usual remedies for its cure, either through the carelessness of the patient or some other cause. But doubtless, strictures, and those too of the very worst form, are seen to occur most frequently after repeated attacks of gonorrhœa. John Hunter denied that stricture was produced by gonorrhœa. One of his reasons for denying it was, that he had sometimes seen instances in which the urethra had become contracted without any previous venereal complaint; but, at the same time, he has not told us whether these individuals had ever received any injury in the perineum. Moreover, the fact of stricture occurring now and then without any previous gonorrhœa cannot militate against the generally-received opinion that gonorrhœa is the main cause of the disease, because there are doubtless some other circumstances, independent of injury even, which may produce stricture.

Injections.

Injections used for the purpose of curing a discharge have been accused by many of producing stricture. Sir E. Home was the surgeon who chiefly promulgated this doctrine: so far was he convinced of it himself, that in the latter part of his practice he entirely left off treating gonorrhœa by injections. Curiously enough, John Hunter was perhaps as correct in his opinion with reference to this point as he was wrong about the one last considered. He says—"It is supposed by many that strictures arise from the use of injections in the cure of gonorrhœa; but this opinion appears to be founded in prejudice, for I have seen as many strictures after gonorrhœa that have been cured without injections, as

Considered by some as a frequent cause.

after those cured with them."* An experience of this kind proves that injections cannot be a *very frequent* cause of stricture at least. The simplest way of ascertaining whether injections produce stricture frequently or not, is to inquire into the history of those who have stricture, and especially in reference to the employment of injections. I have for some time past directed my inquiries to this particular point, and I may with truth affirm that in by far the greater majority of cases the disease had existed without the previous use of any injections whatever; but, on the contrary, in those instances where the stricture is most severe, there had been repeated attacks of gonorrhœa, which had been allowed to run on for months, and where very few remedies of any description had been used. I have seen the very worst forms of the disease in sailors, and it is notorious to what an extent they neglect themselves. Injections, when used in too great strength, may doubtless lead to stricture. I have myself had reason to believe that, in one or two of my own patients, a very strong injection of nitrate of silver had led to the production of the disease; but in these cases it acted very violently, producing severe pain and much hæmorrhage. As they are commonly used, however, it appears unreasonable to suppose that they do beget stricture. It is much more reasonable to allege that they prevent its formation; for, when used with care, and in proper cases, they arrest the discharge, and at the same time remove that irritation and chronic inflammation of the mucous membrane which, persisting for a

Injections not frequently a cause.

When used with caution.

* Hunter *On the Venereal*, p. 168.

length of time, will excite the thickening of the submucous tissue, which constitutes the disease.

Although it cannot be denied that stricture of the urethra is in the majority of cases caused by gonorrhœa, there are other causes which bring it about, and I shall at once proceed to consider them. Next to gonorrhœal inflammation, *injury of the urethra* most frequently produces stricture; and it has fallen to my lot to see so many cases of what is termed *traumatic stricture*, that I am inclined to consider that injury to the urethra much more frequently produces stricture than is imagined. As far as my own experience has furnished me with information as to the causes of this malady, I may with truth say that external violence has been productive of it in a great proportion of cases. Contusions of the perineum, caused either by a kick, by a cricket-ball, or by a bump upon the pommel of a saddle, or across a ship's yard-arm, are frequently attended with a laceration of the urethra to a greater or lesser degree: in some instances the canal is torn completely across, whilst in others it is only partially divided. The locality of the injury is the sub-pubic or curved portion of the canal. This accident, too, may and does occur without any external wound being made: in fact, I think it may be stated that, in every instance of traumatic stricture submitted to my notice, the violence which had produced it had not even caused a laceration of the integuments. It is easy to understand how it is that the disease is formed after such an injury; for when there is an actual solution of continuity in the canal, certain changes necessary for the repair of this loss ensue, and the result is a cicatrix and a contraction of the

External injury.

Traumatic stricture.

How injury produces stricture.

canal. And, indeed, in those instances where there has not been an actual solution of continuity in the urethra, but where there has been only a severe contusion over the canal, a considerable amount of inflammation takes place, lymph becomes deposited around the urethra, and in this way stricture may be formed. If it happens that the canal gets completely torn across, the case may turn out to be one of a most serious and fatal description; for the patient completely loses the power of passing his water, and the surgeon is baffled in his endeavours to introduce any instrument along the torn canal; infiltration of urine takes place, and death results in a few days from the effects of the general and local disturbance set up.

Symptoms not appreciable directly after injury.

It not unfrequently happens that those contusions of the perineum which are ultimately productive of stricture of the urethra are not followed by the symptoms of the disease until some time has elapsed from the date of the injury: weeks, months, or even years, may go by before the patient gets troubled with any difficulty in passing his water. The *immediate* effect of a severe injury to the perineum when the urethra is damaged is retention of urine: bleeding from the orifice generally ensues, and soon afterwards more or less swelling in the scrotum and perineum. These symptoms remain for a time, and, if proper measures are taken, the swelling gradually goes down; and then the patient may feel nothing amiss with him until some weeks have expired, when he is either suddenly taken with retention of urine, or begins to feel that the urethra is getting obstructed more gradually. In some instances it may happen that the violence which has injured the urethra

does not bring about retention of urine even, at first, but in the greater number of cases this occurs. I shall here give two illustrations of the origin and progress of traumatic stricture: they will serve to show several points which have been insisted upon above.

Case. Robert A——, aged twenty-five, a sailor, was brought into King's College Hospital, in April, 1849, with *impermeable* stricture of the urethra, the result of injury. *Two* years previously, whilst in the rigging of his ship, he fell astride a spar, and received a violent hurt in the perineum. He at once suffered most acute pain in the part, and considerable swelling took place. These subsided in a short time, and there was no retention, nor was there any bleeding from the urethra. After laying up for a few days, this man went to his duties apparently well, and was enabled to attend to them for a month, at the end of which period he had a most sudden and violent attack of retention of urine, which lasted ninety-eight hours, when the surgeon, finding he could not introduce any instrument, punctured the bladder above the pubes. From this date the symptoms of stricture of the urethra became more and more decided, and he was obliged to wear a canula in the bladder for a long time. This case will be related at length in a future chapter, as it became one of the most serious instances I ever saw.

Case. The second case, showing how traumatic stricture is produced, is as follows:—George B——, aged thirty-two, a horse-breaker, living in Lincolnshire, was admitted into King's College Hospital in October, 1851, with stricture, the result of injury. He had had no signs of the disease until a year previously, when, one day,

whilst jumping a horse over a fence, he was thrown forward on to the pommel of the saddle. He at once went home, and, on pulling off his clothes, found that blood had trickled down into his boots from the urethra; but he could not see any external wound. This was at about two o'clock in the afternoon. He did not make any attempt to make water until the next morning, when he found he could not pass a drop, and the pain was so severe that he fainted off. A surgeon was sent for, who placed him in a warm bath, by which the retention was relieved: no instruments were passed. After this, there was some swelling, and leeches were applied; but there was no difficulty in making water, and he continued without any symptom of stricture until the expiration of six weeks, when, having had some premonitory warnings by his urine coming away with some difficulty, he was attacked in the middle of the night with complete retention, which could not be thoroughly relieved for three days. From this date all the symptoms of stricture became aggravated, and continued getting worse until the period of his admission to the hospital, when he was found to have a stricture which would not admit any instrument.

Leroy's remarks.

Leroy D'Etiolles has made the pertinent remark that "contusion of the perineum and of the urethra does not produce difficulty of making water until a very long time afterwards;" and then mentions a case where a severe injury was received by a boy at the age of ten, followed by bleeding from the urethra. The result of this injury was very bad stricture, but the symptoms did not show themselves until the patient arrived at the age of manhood. I have reason to

believe that in the following case, the stricture, although so long before it produced symptoms, was caused by the accident referred to by the patient.

Case.

J. C——, aged forty-two, married, and of temperate habits, applied to me with a bad stricture in December, 1851. He states, that it was only within the last few months that he suffered under any symptoms of stricture, and that three weeks previously he was attacked with retention of urine, for which he underwent treatment at the hands of one or two surgeons, there being the greatest difficulty in introducing even a very small instrument. He tells me that he had never laboured under any venereal complaint whatever, and the only circumstance to which he attributes his stricture is a blow which he received upon the perineum from a cricket-ball as many as twenty-two years ago. It was so severe, that he was laid up in bed for *several months.* There was great swelling of the parts which had been struck; but at this time he did not labour under any difficulty in making water, and he felt well after his recovery until the above-mentioned date, when he began to experience difficulty in making water. It is impossible to say with certainty whether the blow in this instance, received so many years ago, did produce the stricture; but there is every probability that it did lead to it. The patient was a person upon whose statement I could perfectly rely.

Serious nature of strictures from injury.

At all events, whatever may be the period at which the symptoms of stricture may show themselves after a severe injury to the perineum, such injuries are undoubtedly most fertile causes of the affection; and, indeed, the practical surgeon cannot attach too much

importance to such causes, for he will find that strictures so produced are the most troublesome he has to deal with: any instance of stricture which has persisted for some time demands his care, but those cases which result from severe injuries call for an unusual amount of patience and skill.

Caused by fracture of the pelvis.

Not only does external violence from blows and contusions on the perineum produce stricture, but it is by no means the result unfrequently of a fracture of the bones of the pelvis. If the ramus of the ischium and pubes be broken, it will happen that the urethra is injured by the fractured portion of bone, and the consequence will be a stricture.

Internal violence.

Internal violence, from the forcible or unskilful use of catheters, or lithotrity instruments, will lead to the formation of stricture. Laceration of the walls of the canal is produced even when it is in a healthy condition by rough usage in the hands of a surgeon; but it is more likely to occur if the patient himself attempts to pass an instrument into his bladder. In one remarkable case which fell lately under my observation, not only a stricture, but a false passage was produced, by a person endeavouring to pass an instrument into his bladder.

Masturbation.

There are other circumstances which doubtless may lead to the formation of stricture; and amongst them may be enumerated the baneful habit of masturbation, so frequently practised by schoolboys. From such practice a turgescence and congestion of the urethral canal must result; and it is reasonable to suppose that under such circumstances a contraction of the canal may take place. Still, it is evident that we do not often meet with

cases of stricture where the parties have not had commerce with the opposite sex, or have not suffered some injury to the parts. Leroy says, that he can only call to mind fifteen such instances: "Ces cas sont rares, à la vérité: pour ma part, je n'en ai guère observé qu'une quinzaine."*

Unhealthy states of urine.

Amongst the occasional causes of stricture, writers have placed certain unhealthy states of the urine. When, for instance, it is loaded with salts, irritation and inflammation of the lining membrane of the urethra may be produced by this, and thus the foundation at least of stricture may be laid; but I suspect it is not often the case.

Ulceration of walls of urethra.

There is yet another cause of stricture, and one appreciable to our observation—viz., ulceration and subsequent cicatrization of the extremity of the penis, or indeed of any portion of the walls of the urethra. But it is for the most part seen on the glans penis; and, in this case, it will be found that it is only the very entrance of the urethra which is strictured. These contractions, however, are very severe, and so tight that they will not permit of dilatation. Sometimes an ulcer forms half an inch from the orifice of the canal, and the necessary cicatrization will be attended by a contraction of the portion of the urethra where the ulcer existed.

* Leroy, op. cit., p. 75.

CHAPTER IV.

TREATMENT OF STRICTURE OF THE URETHRA.

Confirmed stricture rarely *cured*.

BEFORE entering upon the consideration of the various methods which are adopted for the purpose of remedying stricture, it should be stated that at present the surgeon possesses no means of bringing about a perfect cure in by far the larger proportion of cases of confirmed stricture; for although by suitable means the original calibre of the canal may be restored, there is always a tendency for the stricture to return. This disposition to recontraction is observable in all the mucous outlets of the body when once they have become narrowed. This is a fact highly necessary both for patient and surgeon to be convinced of, preparatory to undertaking the so-called *cure* of a case of stricture; and it is for this reason that I shall never in this Essay mention the term *cure* in reference to stricture. It is true, that in some of the slighter forms of the disease there may have been so little change in the part, that a timeous and persevering treatment may produce permanent good results, so that the patient will not suffer anything in after life; but, in the majority of cases, the changes which have taken place are such as to call for the continuance of treatment more or less during the life of the individuals.

Mechanical means chiefly required.

In consequence of this disease being chiefly a mechanical one, as it were, the treatment must be mainly

mechanical, although it will be found that it is highly necessary to combine other measures with the employment of instruments. These mechanical methods are, however, various, and I propose now to enumerate them prior to entering upon the treatment generally; and I think it will be well to consider this treatment of stricture under *three* heads.

Various methods of mechanical treatment.

In the first place, then, we have *Dilatation*, of which there are *three* modifications—simple dilatation, permanent dilatation, rapid or forced dilatation. Next, there is *Cauterization;* and of this there are two methods, or rather, there is the employment of two different substances—viz. nitrate of silver and potassa fusa. Lastly, there is *Incision*, under which somewhat comprehensive term we place several varieties which are practised by the surgeons of the present day:—1st, *Internal* incision, performed either from before backwards, or from behind forwards; 2ndly, *Incision of the stricture from the outside,* or *perineal section*, of which proceeding there are also two varieties—1st, the section at the point of an instrument which cannot be passed through the stricture; and 2ndly, the *section* performed upon a grooved instrument previously passed along the urethra into the bladder.

General measures also required.

These various methods comprise the treatment which mechanical surgery affords: with these also the surgeon will find it necessary to join certain general measures, without which the treatment of stricture will be found to be a mere mechanical art; whereas, in truth, no one can set about the remedying of this malady with any degree of satisfaction either to his patient or to himself, unless he brings with him a know-

ledge of the pathological and physiological changes which take place, and of the effect which these changes in the parts themselves produce upon the system at large, as well as an acquaintance with those remedial agents which are powerful adjuvants in the treatment of stricture.

It is well to state that no one method singly will suit every form of urethral contraction. There will be found several instances in which one plan of treatment alone may suffice for a satisfactory result; but in others it may be advisable and necessary to employ more, or even a modification of the whole combined, so various are the forms of stricture, and so many difficulties may arise during the treatment. Before undertaking the treatment of any one form of stricture, it is necessary to bear in mind with what a delicate structure we have to deal. Even in the healthy state, the urethra is a highly sensitive canal, is easily irritated, and rejects force: its mucous membrane is so arranged as to be with facility torn by the introduction of any foreign body. Moreover, the system at large quickly sympathises with the local disturbance which is produced by any interference with the urino-genital organs.

Great gentleness necessary.

For the purpose of employing *dilatation*, various instruments are used, and during the course of treatment it is found necessary to adopt these varieties, as certain instances will be met with in which it will be better to lay aside one form of instrument for another. The most simple instruments are *bougies*. These are made of different marerials; those in most common use are made of *wax* and *gum-elastic* material, *catgut*, and *gutta-percha*. These instruments are straight, and

Instruments used in dilatation.

so flexible that they can adapt themselves to the shape of the urethral canal pretty readily. Other instruments used for dilatation are *curved*, and made either of metallic or other substances: in these are included the *solid steel bougie* or *sound*, the *silver catheter*, and the catheter of *gum-elastic* or of *gutta-percha*. There are some other kinds of instruments which are occasionally used by the French surgeons; but I do not consider it necessary to enter upon every plan of treatment adopted by them, although I shall not be wanting in deference to those distinguished men who have specially written on this malady.

Bougies of wax.

There is much difference in opinion as to which is the most effectual and safe instrument in the treatment of stricture of the urethra. There are many surgeons who use none other than the *silver catheter* or the curved sound, and who look upon *wax* bougies as very inefficient and worthless instruments; and, on the other hand, some practitioners use the metal instruments but sparingly, and give preference to those which are of a less resisting and more flexible material. Those who object to the use of wax bougies maintain, in the first place, that it is impossible to ascertain by means of a wax bougie whether the stricture is penetrated or not, because the material being pliable and soft, the bougie does not resist the obstruction, but is twisted and bent upon itself; and, nevertheless, the surgeon is deceived into the belief that the instrument is going through the stricture, whereas, in reality, its point may be receding from it.

Objections to their use.

One other objection made against the wax bougies is, that from being composed of so soft a material, they

do not make sufficient impression upon a stricture which perhaps is long, narrow, and tough ; and that in order to accomplish the necessary measure of dilatation, instruments of a more solid and resisting material are required. Although I have seen a large number of strictures treated by means of curved metallic instruments, and am aware that the majority of surgeons use them, I have become impressed with the efficiency and safety of the simple *wax* bougie, and am in the habit of treating cases with this instrument; and I am convinced, from what I have seen, that were it more frequently employed, patients would suffer less than they do, and that a speedier cure would be effected in certain troublesome cases. There can be no doubt whatever that the first-named objection to their use—viz., their tendency to lose their shape and bend against a stricture—is not groundless: still, as a surgeon gets greater experience in the use of the bougie and in the treatment of stricture, he will find this objection to have less force, for he will readily get his fingers (I may so say) acquainted with the difference between the peculiar sensation which exists when the instrument is only pressed up against some obstacle, and is altering its form, and that where the bougie gradually enters the stricture and makes way through the constricted canal. If the bougie is pressed up against the stricture, and is giving way and bending to it, a sensation of constant resistance is conveyed to the hand of the surgeon, very different indeed from that feeling which is observable when, even though the resistance of the stricture obtains, the bougie makes way through it. The bougie will appear to make way ; but as it is pressed on, the

Their safety and efficiency.

Objections to their use answered.

resistance becomes more decided, the patient feels more pain than he ought to experience, and on withdrawal, the bougie will be found to be jagged, twisted, or indented in a spiral form, and even it may be brought out completely doubled upon itself: more or less blood will also follow its withdrawal.

The surgeon who is in the habit of passing instruments into the bladder will soon acquire that knowledge which will tell him when the bougie is making way. At first, when its point arrives at the face of the stricture, he will feel a certain amount of resistance; and if the stricture permits the introduction of the bougie, this resistance will still be felt to a certain extent, but it gradually yields, until it goes directly into the bladder. It is somewhat difficult, all must allow, to ascertain this with precision, but a careful attention will satisfy one on the point. In the first place, if it has gone into the bladder, the bougie may be pushed in quite up to the hilt; and when the pressure is taken off, and the instrument is left to itself, it will remain exactly in the same situation: but if it is only pressed up against the obstruction, or is bent upon itself, a different effect obtains when the finger is taken off the end: the bougie will not remain in the same position, but will rebound to a certain extent, the motion being quite appreciable.

M. Civiale's opinion on wax bougies.

M. Civiale, who may be considered an authority of repute upon this subject, speaks strongly in favour of bougies of wax; and this opinion will be deemed to be more valuable when it is known that at an early period of his practice, when he had not had much experience, he was strongly opposed to their use, but, after the more

mature experience of twenty years, he found ample reason to change his views, and strongly recommended bougies of soft material. The following are his words in 1823:—"De l'aveu de tous les praticiens, l'introduction des bougies n'est pas toujours chose facile, bien plus elle est souvent impossible, du moins quand on emploie celles dont on fait ordinairement usage: à la rencontre du premier obstacle, la bougie s'arrête, ou si elle y pénètre, la moindre pression l'empêche de cheminer; elle se ploie, se pelotonne: on a beau le faire tourner entre ses doigts; elle ne marche point, du moins effectivement, et les divers mouvements qu'on lui imprime deviennent très-fatigants pour l'urètre sans en obtenir aucun heureux résultat. Ainsi sous ce rapport il convient de dire, avec quelques auteurs modernes, que ce moyen est défectueux et souvent impraticable."*

But he says this in 1843:—"La plupart des reproches adressés aux bougies sont, ou dénoués de fondement, ou établis sur les résultats d'une pratique défectueuse. *Nul autre instrument ne pénètre avec autant de facilité que la bougie molle*, nul ne produit moins de douleur et ne s'accommode mieux aux courbures du canal; nul, enfin, ne le fatigue et ne l'irrite moins par sa présence, ou par son séjour. Ce sont là autant de points à l'égard desquels on ne peut élever aucune doute."†

The other objection to the use of the wax bougie—viz., that it is not sufficiently resisting to make much impression upon the stricture—is also not without foundation; for the material of which it is formed is so soft, that when the instrument has penetrated the stricture,

* Civiale, *Nouvelles Considérations sur la Rétention d'Urine*, p. 18.

† Civiale, *Traité des Maladies de l'Urètre*, p. 232.

it becomes deeply indented, and thus it would appear that no great amount of dilatation could be effected by a bougie of such construction: and, indeed, if the stricture be very dense, little will be effected unless the surgeon resorts to some other dilator. Nevertheless, in the greater number of instances of stricture we shall find that the wax bougie is an efficient means of dilating. That the actual and immediate dilatation of the urethra will in a great number of cases be more limited and less rapid, cannot be denied. Still, it is my impression, from what I have observed, that although *apparently* time may be lost by using the wax bougie, in reality the course of treatment is rendered shorter, because the use of the wax bougie is not accompanied with that irritation which so frequently obtains when metal instruments are employed, and thus it is not necessary that the treatment should be suspended. On the other hand, if the surgeon has a bad stricture to deal with, and examines the urethra with a curved metallic instrument, it happens not unfrequently that he is not able at first to hit the orifice of the stricture, and several attempts are perhaps made, with more or less force, before the instrument can be introduced into the stricture. I have often and often seen this happen in the hands of very competent surgeons. The consequence of this is, that if the urethra is irritable, the patient suffers a great deal; bleeding takes place, and there is considerable pain, and it will last for hours and days; so that it will be useless and hurtful to repeat the attempt to pass the instrument for some time. In some of these cases, where it cannot be got through the stricture, I believe the lining membrane of the urethra is lacerated.

How the wax bougie is superior in some cases to metal instruments.

Ill effects of metallic instruments.

Besides the inconveniences just mentioned, more serious results happen. The system at large sympathizes acutely with the local disturbance; and, after an attempt has been made to pass a metal instrument on an irritable subject, general fever of a severe nature, rigors, and other troublesome symptoms, are produced, so that the patient is obliged to be confined to his bed, and it will be impossible for the surgeon to make any further attempts perhaps for days or weeks: and even it will happen that a prolonged attempt to get through a stricture will be followed by such excessive disturbance as to lead to apprehensions of danger. Such a case occurred in the hands of an eminent surgeon a short time ago. One prolonged attempt only was made with a metallic sound to get through a stricture, and the symptoms were such as to lead the surgeon to fear that death would ensue.

It must not be supposed from these observations that I wish to deny the great efficiency of metal instruments, or that I wish to throw them aside altogether: on the contrary, I am fully impressed with the conviction that, in a great number of instances, and in the hands of a careful surgeon, the metallic sound or catheter is the instrument which is best adapted for the purpose of dilating the urethra, and that, in certain stages of the treatment, it should be used almost invariably. I only wish to show that in the indiscriminate use of metallic instruments much mischief occasionally results, and that in the wax bougie the surgeon possesses a valuable means of treating a stricture, and that not unfrequently he will be able by its use to get through the treatment of a case more safely than if metal instruments alone are used.

Gum-elastic bougies.

The *gum-elastic bougies* are much used by some surgeons, and are considered superior to those of wax, in consequence of their greater smoothness; and there is no doubt that the gum-elastic bougie is a valuable instrument in the treatment of some forms of stricture. But the same kind of objection obtains against this as is urged against the wax bougie: that, being pliable, it bends when it meets with an obstacle in the urethra, and therefore it is not easy to ascertain if the point of the instrument is within the stricture or not; and if further pressure be made, with the view of advancing it into the bladder, the mucous membrane of the urethra may be torn and a false passage be made more easily than if the wax bougie had been used: consequently, it may be considered that the gum-elastic bougie is not so safe an instrument to employ when the stricture is so narrow as only to admit one of a very small size. After the urethra has been so far dilated as to admit a No. 4 or 5, the gum-elastic will not only be found a very safe instrument, but even a more efficient one than the wax, because it gives less pain from its being more highly polished, and it is also more resisting.

Gutta-percha bougies.

Within late years, bougies and catheters of *gutta percha* have been introduced, and much used by the French surgeons. I have had several opportunities of testing their efficacy, but consider that they are not superior to the gum-elastic instruments. There is, too, one very grave objection to their use: this is, that they are liable to break in the bladder. A very striking instance of this was lately under the care of Mr. Fergusson. He was called upon to perform the operation of lithotrity upon an elderly gentleman, and during the

proceeding he caught hold of a foreign body by the forceps, and had considerable difficulty in extracting it. At last it came out, and was found to be the end of a gutta-percha catheter covered with deposits, which had been broken in some twelve months previously.

Metallic instruments.

Some surgeons never, or but rarely, use anything else but metal dilators; and these are either silver catheters, or solid sounds, made of steel, or steel plated with silver. The silver catheter is that perhaps most ordinarily in use, and is well adapted for the treatment of stricture. The instrument varies much, both in the shape of its curve and in the size of its point. The curve is either considerable, or short and abrupt; and my old respected teacher, Mr. Simon, even recommended some catheters whose curve was so slight that they were almost straight; and he used to assert that it was better for a beginner to practise catheterism with straight instruments: but it is almost universally conceded that the best form of catheter is where the curve is moderate,—neither too small, too abrupt, nor too extended. With respect to the shape of the point, there is an important difference: in the one kind, the instrument gradually tapers from its body to its extremity, and it is thus *conical;* whereas in the more ordinary kind the extremity is of the same size as the body of the instrument.

Conical catheters.

Objections to them.

The main objections to conical catheters are that the point may more easily penetrate the lacunæ, and more readily tear the urethra. Moreover, if there be more than one stricture, it will be difficult or almost impossible to know whether the instrument be stopped by the second obstruction or not; for, in consequence of the

diameter of the catheter increasing from the point, it may be prevented advancing by the first stricture only.

Catheters.

There is one great advantage which the *catheter* possesses over every other form of instrument. This consists in its being hollow: consequently it is always, or almost always, possible to ascertain if the stricture has been fairly penetrated—a circumstance of no trifling importance alike to the patient and surgeon. This is more particularly the case in certain complicated instances where the urethra is much contorted, or where a false passage exists between the prostate and rectum; for if the latter exists, the surgeon may be enabled, even without giving the patient any particular amount of pain, to pass his catheter quite up to the hilt, and apparently get into the bladder, whilst in reality its point is running along between that viscus and the rectum. If a solid sound is used, it will be difficult to tell whether its point be going wrong or not; but if a hollow catheter be used, the non-appearance of urine from the opening will be strong evidence that the bladder has not been reached, especially if there be any urine in it.

Their advantages.

Solid sounds.

The other instrument for dilating the urethra is the solid metal bougie, curved in the same form as the catheter. For the simple purpose of dilating a stricture, I look upon the solid steel sound, plated with silver, as by far the most efficient kind of instrument; for it is so heavy, that it will glide along the urethra almost with its own weight. These sounds should be furnished with a somewhat large wooden handle, so that the surgeon may obtain a firm hold when he is using them; a matter of very considerable importance—not that any force is necessary or advisable, but that the complete

steadiness of the hand and wrist may be imparted to the instrument, which cannot be so well effected unless a firm hold of the handle is obtained.

It is hardly necessary to state that the surfaces of catheters and sounds should be highly polished and perfectly smoothed, and should not have even a scratch upon them: therefore, after their use, they should be thoroughly cleansed and kept in a case in separate partitions.

Metallic instruments possess the superiority over others of a softer texture, that they produce a greater impression upon an unyielding stricture, and thus, when cautiously used, effect dilatation more rapidly and more completely. For this reason, only the silver catheter and solid steel sound are more frequently used by surgeons; and it must be confessed that they are more strictly surgical instruments than any others made for treating stricture.

Efficiency of metallic instruments.

In the hands of the practitioner who knows the anatomy of the parts well—who is never in a hurry to get through a stricture, but feels his way cautiously, with a determination to use no force—the curved metal instruments are the most efficient agents for dilatation; and there are some forms of stricture where it will be almost useless to go to work with any other. But still, in the hands of those who are not so skilful and not so patient, much mischief may be done by these instruments; and having had many opportunities of witnessing this occur, I am the more inclined to give the preference to the use of the common wax bougie in more instances than it is ordinarily used. However, the surgeon must not confine himself to one instrument;

for he will find that circumstances will so obtain that it will be advisable to use one form of instrument at a particular stage of the treatment, and then lay it aside for another, although in many cases the whole course of treatment may be conducted by any kind of dilator in use.

Gum-elastic catheters.

Although, when catheters are used, those of metal are generally preferred, the surgeon will find that the gum-elastic catheter is a valuable instrument—inferior, it is true, as a dilator to the metallic, but superior in this respect—that any curve may be given to it, or it may be introduced as a straight instrument. The gum-elastic catheter is, however, found mostly useful when it is required to keep an instrument constantly in the urethra: it is both less irritating to the urethra and bladder than one of metal, and it possesses this advantage—that when the stilette is pulled out, it readily bends, and thus the wearer may even walk about with it in his bladder; whereas it would be almost impossible to do so when a metal instrument is kept in.

CHAPTER V.

TREATMENT BY TEMPORARY DILATATION.

Exploration of the urethra.

BEFORE entering upon the consideration of the treatment by dilatation, I shall make some observations upon the exploration of the urethra for the purpose of discovering stricture: for although the symptoms which have been mentioned are generally sufficient to indicate that some obstruction exists, they are not always so, and it is possible to be deceived. It is necessary, therefore, that a premature opinion should not be given, even if a person has strong suspicions of stricture: for he may suffer from several of these symptoms, be convinced that he has stricture, and, labouring under this idea, may go to a surgeon who, perhaps, being too prematurely convinced, takes a small catheter and passes it along the urethra, and carries it as far as the bend of the canal without meeting any resistance; but here its point is stopped, and at once the opinion is formed that a stricture exists. From time to time, the same instrument is introduced, and is as often stopped at the identical spot. Perhaps catheters of smaller size are introduced, and yet none of them can be got into the bladder; force may be used—bleeding occurs, and the mucous membrane is lacerated. And withal there may be no organic stricture: for, finding that there is no improvement in his symptoms, and that they are even getting worse, the patient applies to another sur-

Small instruments not advisable.

geon, who is more cautious and more proficient in the use of his instruments: a gentler attempt is perhaps made with a full-sized catheter, and, to the surprise both of patient and surgeon, the instrument goes freely into the bladder, and in a short time, if no further interference is made, all the symptoms gradually yield. That this is a true picture, and a case that not unfrequently occurs, any surgeon who has had much to do with the treatment of stricture can affirm. It has often happened to me to meet with cases of this nature, and I have on more than one occasion been struck with the mistakes which have been made.

Objections to small instruments.

When this occurs, it probably depends upon the following circumstance:—The surgeon either uses too small an instrument, and gets its point into one of the lacunæ, or he does not give it the proper inclination; consequently, its point either lodges in the sinus of the bulb, or hitches up against the lower surface of the triangular ligament: and this circumstance will the more readily happen if the urethra is in a state of relaxation, and if care is not taken by the surgeon to put it on the stretch with his left hand. Or it will happen that, if any force is used, the mucous membrane of the lower surface of the bulbous portion gets slightly lacerated: and if succeeding attempts are made with the same kind of instrument, the point almost invariably travels in the same direction as it originally did; and thus the surgeon will be continually thwarted in his attempts to get it into the bladder, and necessarily consider that an organic stricture exists. The instrument may also, especially if it be roughly passed, get obstructed in consequence of a spasmodic action of the muscles which

surround the urethra. It is extremely important to bear all these circumstances in mind before proceeding to the exploration of the canal, or undertaking the treatment of stricture.

I shall now describe the manner in which an examination of the urethra should be made: and although it has been recommended by various authors to ascertain the existence of a stricture in various ways, and by instruments of a more or less complicated nature, I shall content myself with stating that method which I am generally in the habit of employing when a patient applies to me suffering with symptoms of stricture.

Mode of examining a patient for stricture.

In the first place, then, it is advisable to examine the orifice of the urethra: and for this purpose the lips of the meatus should be opened, to see if any contraction exists in this situation; for this is by no means an unusual seat of stricture, either from ulceration of the glans penis or some other cause. Subsequently to this being done, the finger should be run along the course of the urethra outside: for if a stricture implicates the spongy portion anterior to the scrotum, and has been of long standing, a hardness, more or less limited, will be felt, indicating its position. This external examination is likewise necessary for the purpose of ascertaining if there be any hardness or sinus about the perineum, which may in this way be discovered. If nothing is indicated by these means, the next step is to take a wax bougie of moderate size (say No. 6 or No. 7): this is well oiled, and its terminal half is curved in a slight degree, so that it may be better adapted to the natural form of the canal. Nevertheless, this is by no means necessary. The instrument is now gently intro-

duced with one hand, whilst the penis is laid hold of by the other and gently put upon the stretch. The bougie is now carried, by a motion neither too rapid nor too slow, along the canal until it becomes arrested: gentle pressure is now made for half a minute or a minute, and the effect is carefully noted. If the point enters the contraction, the bougie is felt to be grasped, and a certain amount of resistance is experienced when an attempt is made to withdraw it; or if it be let alone, it will remain quite stationary. If, however, the point is only pressing against the face of the obstruction, the bougie will recoil for some little distance when the hand is removed from it; and although it may appear to have entered some way further along the canal, it will be pretty strong evidence that the bougie has become bent or twisted. In this case, it will be necessary to take a bougie two sizes smaller, and repeat the same process with like caution. If the obstruction is met with at the very same spot, still smaller instruments should be used, until the contraction is penetrated, or the bougie is carried fairly through it into the bladder. It will be sufficient, as an exploratory measure, in many cases, merely to involve the point of the bougie in the stricture, without actually going through its length; but in an instance where the difficulty of making water is very great, and where the patient is suffering much, it will be highly desirable to get the bougie through the stricture into the bladder: for not only will there be considerable relief as regards the power of passing water, but the mind of the sufferer will be materially relieved; and it will be found that, in the majority of cases, the stricture is not so very narrow as not to allow

of the passage of a No. 1 or No. 2 bougie cautiously and slowly passed. Upon withdrawal of the bougie, there will be much resistance, and its surface will be indented in a circular direction, in proportion as the contraction is more or less narrow and tight. One very important point is now gained—viz., the discovery of the situation of the stricture; and it is always the custom with myself, when I have the opportunity, to measure with care the exact distance at which the stricture is seated.

During this exploration, it may be ascertained that a stricture is met with and fairly penetrated, and yet the bougie is obstructed at a distance beyond, instead of going into the bladder; and a little careful manœuvring is now required to find out whether or not a second stricture exists, or whether the point of the instrument is only hitching up against the triangular ligament, or has entered one of the lacunæ. With this view, then, careful and gentle pressure is made; or, if this does not succeed, the bougie is withdrawn for a short space and again moved onwards. By this means the difficulty will generally be overcome: for, as Sir Charles Bell has remarked, it will mostly be found that the first stricture is the narrowest; and thus, if the instrument passes through it, the one beyond may be penetrated.

Use of metallic instruments.

For the purpose of exploring the urethra, the silver catheter, steel sound, or gum-elastic catheter, which are all curved, are used, and the same cautions are employed. If metal instruments are used, it is necessary to warm them thoroughly as well as to oil them prior to introduction; for there is no doubt that, when they are well warmed, they cause less irritation and spasm. In general, I object to the use of metal instruments for

examining the urethra in severe cases, as observation has led me to conclude that more difficulties arise from their use, and that the examination is less satisfactory. The objections, however, which I have referred to do not obtain in the after-treatment of stricture where the canal has been in some way opened up; for then these instruments will be found to be much more adapted for carrying on dilatation. Sir C. Bell in former days, and Leroy in the present time, has recommended that the urethra should be explored by means of instruments to the extremity of which is attached a little round ball: it was considered that a more accurate examination as to the situation, extent, and number of the strictures could be made. In certain cases, where the contraction was not great, these instruments could accomplish the object intended; for the bulbous extremity could be made not only to produce a resistance, and thus indicate the exact position of the obstruction, but it also could be passed through it, and in this way the length and the numbers of the strictures might be ascertained. But one grave objection to the use of such instruments consists in the circumstance that, in a great number of cases of stricture, the contracted portion does not permit the passage of the bulbous extremity; and in some instances, even if it could be passed through, there might be some difficulty in withdrawing it. For these and other reasons, the surgeons of this country do not use instruments of this kind.

Exploring strictures with bulbous instruments.

Objections to them.

Before examining a patient with stricture, I am in the habit of asking him to pass his water before me, in order that I may form some idea, by the size and force of the stream, as to the amount of contraction.

If the wax bougie is used for the exploration of the urethra, I place the patient against the wall; but if the silver catheter or sound be the instrument employed, I almost invariably follow the advice given me by my old teacher, Mr. Fergusson, and desire the patient to recline upon a couch, and place myself on his left. I then dip the instrument into hot water, dry it and well oil it; next, the penis is held lightly between the fore-finger and thumb of the left hand, and, by a little pressure on the glans, the meatus is opened; the point of the instrument, with the concavity of the latter looking towards the groin, is inserted into the urethra, and this is gently traversed until the obstruction is met with. The stricture may be met with in the middle of the spongy portion of the canal; and in that case it will not be necessary to change the direction of the instrument: but should it not be arrested before it approaches the bend of the canal, it will be necessary to carry the hand slowly across to the central line of the abdomen, with the concavity of the instrument looking forwards and upwards, so that it may accommodate itself to the curve of the urethra. The handle of the instrument is then slowly depressed until it is brought into the horizontal position, when, if there be no obstruction sufficient to impede its progress, the catheter, being gently urged forward, will enter the bladder. If a stricture is encountered, gentle pressure should be employed when the point of the instrument may be felt to enter it. Should this not take place, the catheter must be withdrawn partially, and again gently advanced with the direction of its point slightly changed: the contraction may then probably be fairly

entered, and by a little pressure be overcome: at all events, the situation and condition of the stricture may be ascertained. During these movements, the penis should be gently extended.

It is most desirable, both for the sake of the patient and the operator, that all these movements should be conducted in the most gentle manner. Some persons with stricture have such an irritable urethra, that they cannot bear the introduction of a metal instrument, unless this is effected very slowly indeed, and by a process which necessarily becomes tedious to the surgeon. In such cases it is that I most decidedly prefer the solid steel sound, as it is so much heavier than a hollow instrument, and is advanced with much greater facility.

False passage.

If the case under examination should be complicated by false passages, or if the point of the catheter, having passed beyond the stricture, should deviate from the right direction, or become arrested in front of the prostate, as will frequently happen in a difficult case, I prefer at once introducing my left fore-finger into the rectum, so as to assist the gentle efforts made by the right hand, to spending much time in endeavouring to pass the instrument in the right direction by changing its position, or using any forcible efforts. It is impossible to use too much caution in a trying case of stricture, for more mischief can be done in one hasty attempt to get through a bad stricture than can be undone in years. I am not singular in giving this opinion, founded on facts: any surgeon who has observed this class of cases with care, both in the living and in the dead, is able to do the same. "Employ the

utmost caution" may be worn-out advice, but it cannot be too often repeated. I believe that in a considerable proportion of cases where a false passage has been made, the patients do not suffer very much if they are in the hands of a careful surgeon: nevertheless, if by some mishap this occurrence should have taken place, and the operator does not recognise it, serious mischief, and even death, may be produced; and it is very possible to make an opening into the rectum. One instance of this latter casualty fell under my notice some years since; and it was the more deplorable, insomuch as the patient did not have stricture at all: retention from paralysis had taken place, and a very inexperienced practitioner had in all probability mistaken the lower border of the triangular ligament for a stricture, and forcibly urging the point of the catheter onwards, had thrust it into the rectum. Case.

An experienced hand will appreciate the occurrence of a laceration of the urethra, immediately it takes place, by the peculiar sensation which cannot be described in words, and by the flow of blood. If there is not any urgency in the case, it will be prudent not to make any further attempt at catheterism for some little time. If there be a necessity to get through the stricture, the catheter which was employed should be withdrawn, and a size somewhat larger should be used; and if the laceration should have occurred at the back part of the canal, the finger should be introduced into the rectum, so as to guide its point safely along the natural course of the urethra. If this be not done, and if the surgeon persists in using the same instrument with which the laceration has been caused, he may

unconsciously perforate the walls of the urethra, carry the instrument along in any but the right direction up to its very hilt; and if the false route is in the middle line between the prostate and rectum, the rings of the catheter will be perfectly horizontal—the surgeon flatters himself that the instrument has reached the bladder, and he accounts for the absence of urine by the assumption that the bladder is empty, or he fancies that the point of the instrument is against an impermeable stricture; continual operations are performed, the instrument traverses with ease the same route, and yet the error may not be discovered.

Case. I have before me, as I write, a beautiful drawing, by my friend Mr. Alexander Edwards, of the University of Edinburgh, of the parts removed from the body of a patient who died August, 1854, from cholera, whilst undergoing treatment for supposed impassable stricture of the urethra, through which it had not been possible to pass any catheter. After death, the urethra was found perforated; and, in the sketch, a bougie passing between the prostate and rectum shows the false passage, and the course which the instrument had always taken; whilst the stricture, which was in the bulb, far from being impassable, permitted of the introduction of a full-sized director.

Case. Some time ago, I was consulted by an eminent provincial surgeon regarding the case of a gentleman into whose bladder it was not possible to introduce an instrument, although a large catheter could be passed apparently in the right direction up to the hilt. This gentleman had been brought up to London to consult a hospital surgeon of distinction; but it appears that no

satisfactory opinion was given. I took great care in examining this patient, passed the large catheter apparently into the bladder; but on introducing my left fore-finger into the rectum, I could distinctly feel the instrument gliding between this gut and the prostate, and satisfied my friend that a long false passage had been tunnelled in that direction, and that it would be well to leave the patient alone for some time.

There are various methods, as I have before stated, of practising dilatation; but that which is mostly followed by British surgeons is termed *temporary dilatation;* that is to say, instruments are passed through the stricture from time to time, and allowed to remain in the urethra from a period varying from a minute to half an hour or an hour, in order that the simple effect of the dilating process may be produced: my remarks, therefore, will now apply to this method. In the first place, it must be borne in mind, that the fact of the surgeon being able to carry on dilatation presupposes the permeability of a stricture to an instrument; and, moreover, there is ample reason for believing that if an instrument, however small, can be introduced, there is a possibility, and even probability, of being able to remove all the manifestations of the malady, and dilate the urethra to its original calibre.

Temporary dilatation.

Having, then, ascertained the position of the stricture, I take a wax bougie of that size which will enter; and, in a bad case, this may be a No. 2 or 3. This is slowly passed into the stricture, and through it, if possible, and the effect upon the parts is ascertained. If the bougie traverses the contraction pretty easily, and produces no pain, it may be taken out, and one of a larger

Author's method of conducting dilatation.

size may be put in. As a general rule, the bougie is permitted to remain in the urethra from five to ten minutes; but this must necessarily depend upon circumstances. If there is not much pain produced during its passage, or if the sensibility of the urethra becomes diminished in proportion to the time the bougie remains, it may be kept in for a longer period; but if the sensibility increases, it must be removed shortly—otherwise the patient will not only have a great deal of present suffering, but more harm than good will be produced by this attempt at dilatation. As, therefore, there are many persons who will not complain when they are suffering greatly, I generally make a point of putting the question to the patient as to whether the irritation in the urethra is lessened or increased by the persistence of the bougie, and act accordingly. As some irritation will always be produced by passing an instrument through a stricture, it will be necessary to wait until this has subsided before another attempt at dilatation is made. In a great number of cases the surgeon will be able to proceed with the treatment in the course of two or three days; and then an instrument of a size next to the one last used should be passed, and allowed to remain in the urethra during the same lapse of time as before, or even a little longer. If, however, the stricture is a very tight one, and there is much difficulty found in introducing a bougie of this size, it will be desirable to pass first the very same instrument that was used on the last occasion, as the parts in this way will be less stretched. This treatment should be pursued twice or three times a week, until a bougie equal to the size of a No. 6 or No. 7 can be

Wax bougies used at first.

passed through the stricture. When this has been effected, I lay aside the wax bougie, and now begin further dilatation with the metal instrument, either the silver catheter or the solid steel sound. The former is preferable, for the reason that the water can be drawn off by it, the patient's feelings are thereby gratified, and the bladder is completely emptied—which is a matter of importance. But the solid steel sound is better in this respect: it is heavier, and acts more powerfully as a dilating instrument. The reasons why I object to the use of metal curved instruments at the commencement of the treatment of a bad case of stricture have been already mentioned. In the latter part of the treatment however, there is no doubt that they should almost always be used; but in the beginning of the treatment of a very narrow stricture, it appears to me that there is much more chance of a small curved metallic instrument being arrested short of the stricture by one of the lacunæ of the urethra, and not hitting the orifice of the stricture itself. Attempts are repeatedly made to introduce the instrument: the mucous membrane is lacerated, the patient is hurt, and, in some instances, is afraid to undergo the same punishment; or such irritation is produced that it is impossible to do any good by passing the instrument again. After a short interval, if unfortunately a false passage has been made,—which, in my opinion, is very frequently the result of an attempt to pass these small metallic instruments,—it will be very difficult to avoid the opening in subsequent endeavours to get through the stricture. The consequence of all this is, that, instead of advancing, the patient retrogrades, and, in fact, much more mis-

chief than good is effected. But, in consequence of the wax bougie being made of a material which will be acted upon by the natural temperature of the urethra, it will, if passed slowly, get the natural curve of the canal, and, being less resisting, it is not so liable to injure the urethra, and cause such serious irritation as occasionally results from repeated attempts to pass a small catheter. But when the stricture has been opened up so far as to admit a good-sized instrument, a silver catheter or metal sound may be passed with much more facility, and with less likelihood of doing mischief; and as, undoubtedly, dilatation can be carried on with it more quickly than with the less resisting bougie, it should almost invariably be employed at the latter stage of the treatment. Although I have spoken of using the wax bougie only at the commencement of the treatment, I sometimes use a gum-elastic bougie, or alternate their use, as it seems fitting. In order to illustrate the points above referred to, I take the following case from my note-book :—

Metallic instruments used subsequently.

Case I. It is that of the patient J. C——, the former part of whose history I have related at page 59. This man applied to me December 13, 1851. He stated that, having suffered some difficulty in making water for several weeks, he was suddenly attacked with retention of urine three weeks prior to his consulting me, and that he applied to an hospital, where prolonged attempts were made to pass a small silver catheter into the bladder by the house-surgeon and others. After being put to excessive pain for a long time, a No. 1 silver catheter was passed, and the urine was drawn off. He was put to bed, and treatment was

regularly commenced by Mr. ——, the surgeon to the hospital, who passed a silver catheter along the canal many times, but retention of urine came on every time after the attempt was made, and the man was put to great pain, so that at the end of *three* weeks only a No. 2 silver catheter could be got into the bladder.

On examination, I found no cicatrix or thickening in the perineum. On passing a flexible bougie carefully down the urethra, it was arrested at four inches and a half from the orifice by a stricture which was very irritable. I tried cautiously with a No. 3, but could not get through it. I took No. 2; this went through, but was arrested about one inch and a half beyond by a second stricture, which, however, soon yielded, and allowed the bougie to pass into the bladder. I kept this in ten minutes.

December 15th.—This operation was not followed by retention. I passed successively No. 3 and No. 4 gum bougie into the bladder without causing pain or irritation.

17th.—Passed No. 4 and No. 5.

22nd.—There was some bleeding after the last was passed. To-day I introduced No. 5 and No. 6.

27th.—This was an exceedingly cold day; and on attempting to pass the bougie, a good deal of spasm was produced, and I could not get it in.

31st.—Some retention took place after this attempt, and there was also considerable bleeding: I only was enabled to pass No. 4 with ease. He could now pass his water in a considerable stream. After this, I tried on two or three occasions to pass instruments; but there

was a good deal of spasm produced, and the patient went into the country until

February 2nd, when he again applied, and I was able to pass a No. 6 wax bougie without producing any irritation, but it was firmly grasped.

4th.—Passed No. 7: bougie tightly grasped.

9th.—After the last bougie was passed, there was a good deal of pain and bleeding, and the man had a shivering fit, and therefore did not apply until to-day, when I contented myself with passing No. 6, which went in easily.

17th.—To-day I passed a No. 6 silver catheter; and, as the instrument passed through the stricture with facility, I tried No. 8 silver catheter, and got this fairly into the bladder.

24th.—Passed successively No. 8 with great ease, and then went on to No. 10 silver catheter. From this period I occasionally passed No. 10, but did not use any larger instrument, as the urethra was small, and all appearance of stricture had been removed.

Remarks upon preceding case.

In this case are exemplified some of the difficulties which are attendant upon the use of metallic instruments when the stricture is very narrow. It has been seen that very little progress could be made at the outset by this treatment, even in the hands of a most accomplished surgeon. Retention followed every attempt at dilatation, and, in the space of three weeks, only a No. 2 could be introduced. But when the straight and flexible bougie was used, the retention did not follow; and so rapidly could I dilate the canal, that in little more than a week I was enabled to pass a No. 6. Retention did occur once, and the progress of

dilatation was stopped for a time in consequence: but I believe this was owing to my passing the instrument on a very cold day, when the patient himself was shivering; which was a great error, and should always be avoided.

I must again state that my remarks with reference to the employment of wax or gum-elastic bougies are only to be applied to cases where the urethra is very irritable, the stricture very narrow, and complicated, perhaps, by the existence of a false passage. If this latter exists, I believe, in many instances, it may be better avoided by a wax or flexible bougie than by a small metallic instrument. As a general rule, however, time should be allowed to elapse, in order that the laceration may heal. But this time cannot always be afforded: in such instances more than ordinary care must be used in the treatment.

Cases are, however, frequently met with where the stricture, although not narrow, is excessively unyielding, and involves a considerable portion of the canal. It is possible, perhaps, to introduce so large a size as a No. 7 or 8; yet the patient may suffer severely, and the case be a more tedious one than if only a No. 2 or 3 could be introduced. This especially obtains when the contraction is seated about an inch from the orifice, and also not unfrequently when it is at the bend of the canal. I never think of using the bougie in such cases, but proceed at once to dilate with the solid sound or catheter, and at each sitting allow the instrument to remain in from half an hour to an hour or more; and it is surprising how slowly even then we shall get on with some of these cases. I will briefly relate one or two instances.

Case II. Captain M——, aged thirty, applied to me, May 30, 1854. First felt the symptoms of stricture shortly before his marriage, in 1851, at which time they increased very much. Retention of urine frequently attacked him; once in an unfortunate position, whilst a passenger on board a mail-packet from the coast of Africa without a surgeon. However, this, as the others, was got over by large quantities of laudanum. Since his arrival in England, he had various treatment. No. 8 catheter was passed by his last surgeon, who taught the patient to introduce one for himself. The instrument, however, was not sufficiently large, and the symptoms increased so much, that when he applied to me, he passed his water with great difficulty, had to rise several times in the night, had incontinence of urine, and obstruction to seminal emission.

With all these symptoms, I was surprised, on making an examination, to find that, with some patience, I could pass a No. 8 silver catheter through a very firm and long stricture at the bulb.

Next day I was enabled to pass a No. 9, but it was grasped most tightly. I left it in a considerable time. It was necessary to introduce this same instrument several times, and leave it in a long time, before I could get on to No. 10, which, when introduced, was so tightly grasped, that I could have pulled the patient off the sofa by it. Comparatively little irritation was produced; and after the introduction of a No. 10 five or six times, it went in pretty easily, and all his symptoms were subdued. I desired him to get a No. 9 catheter, and pass it for himself occasionally.

Now, in this case it would have been perfectly useless

to employ the wax bougie: dilatation even with the metal instrument was not readily effected. This instance also shows how severe the symptoms may be, although the contraction is not narrow. This fact is, however, most probably accounted for by the implication in the disease of a considerable length of the urethra—between one and two inches.

Case III. Mr. B——, a gentleman from Lancashire, aged forty-three, otherwise in perfect health, consulted me, June 1, 1856, for stricture. He had had gonorrhœa very badly several times, and had used injections freely. First noticed difficulty in passing water when he was twenty-five. At twenty-seven, had a blow on the perineum, followed by difficult micturition, and, at the end of three months, by an abscess, which was opened at the point of a catheter, which was kept in for some time (probably this was the old operation of perineal section). He recovered in three months, and had No. 10 passed occasionally. His symptoms increased of late years, and have become so bad, that for the last three months he has been compelled to pass a catheter for himself whenever he wanted to make water, never being able to go about without an instrument in his pocket. In this unhappy situation, and suffering much, he applied to me.

On examination with a No. 5 silver catheter, I found an obstruction at the bulb, which did not permit the instrument to pass. I, however, managed to introduce a No. 4 through a tough and long stricture into the bladder. The urethra was not irritable, and the urine was not unhealthy. This gentleman could only afford a week in London, and, as the urethra was not irri-

table, he proposed that an instrument should be passed every day.

June 2nd.—No irritation had been produced. I passed Nos. 5 and 6.

3rd.—No. 6 passed. I found that there was a stricture about one inch from the meatus. The catheter was retained more than one hour without producing pain.

4th.—For the first time for three months, he was enabled to pass the day and night without resorting to his catheter. He passed his urine in a stream, and had no pain or irritation. I passed No. 6, left this in for a considerable time, and was then enabled to introduce No. 7, which remained in for one hour.

I could not succeed in passing a larger number than 7 fairly into the bladder, although I tried to do so three times. The stricture at the bulb was long and unyielding; and that in front so grasped the No. 8 catheter, that I could only succeed in passing this latter as far as the second stricture, although the No. 7 was allowed to remain in for upwards of an hour each day. The patient was obliged to leave London in a few days; but he had improved wonderfully, and was enabled to discard his catheter.

Now, in this case is presented an instance where, in the first place, the stricture at the bulb was traumatic, and where a second contraction existed just behind the glans—two circumstances especially rendering dilatation most difficult. We shall invariably find a stricture near the orifice most rebellious to treatment, and in such an instance the dilator must be a metallic one: the wax or flexible bougie would not be of any service in such a case.

The inability of the patient to pass water by the natural efforts in this case was remarkable, considering that I could pass No. 4; and the speedy relief was as remarkable.

There are several points in connexion with the process of dilatation to which it is necessary to pay great attention; and, indeed, much of our success in the treatment of stricture will depend upon the attention *to detail*. It must be borne in mind that, although the surgeon can do but little without mechanical means, other measures are to be combined with them; and that many points are to be taken into consideration at the time that dilatation, or, in fact, any other plan of treatment, is being carried into effect.

Necessity of attending to general health

In the first place, then, it will be necessary to learn the general habits of the patient, and to ascertain what condition his health is in: for it not unfrequently happens that there exists a general state of irritation, which has been induced by the local malady, as most patients who suffer from this disease delay consulting a surgeon until the symptoms become very harassing; and, moreover, many of those patients are free livers, addicted to Bacchus and to Venus. The stomach sympathizes with the urino-genital organs; and thus it will be found that individuals labouring under stricture in a severe form become dyspeptic, get low-spirited, lose their sleep, and suffer from constipation. More or less irritability of the bladder exists, in consequence of a certain amount of irritation or inflammation going on in its mucous membrane, or from this viscus not being completely emptied of its contents, and retaining decomposed urine.

Necessity to examine the urine.

In the first place, then, after having examined the patient generally, it is most desirable to ascertain, by testing, the condition of the urine; and if it is unhealthy, the morbid state is to be corrected by suitable remedies. Every now and then, instances will be found where a surgeon may be able to pass instruments, and yet the dilatation does not proceed in consequence of the irritability of the parts; but if remedies are employed for the purpose of removing this, he will be surprised to find what good is effected, and with what comparative ease the treatment may be conducted.

Treatment of disordered states of urine.

If the urine be clouded with mucus, or if pus-globules are found on examination, and at the same time the patient is troubled with a frequent desire to pass water, accompanied with more or less pain, it will be useful to prescribe for him the decoction of pareira or of uva ursi, together with a few minims of tinct. of opium, or of hyoscyamus, prior to the commencement of the process of dilatation, or, at all events, whilst it is being carried on: and if an alkaline condition of the urine exists, twenty minims of the dilute muriatic acid may be added to each dose. Should, on the contrary, the urine be over-acid, and should at the same time increased irritability of the parts exist, a mixture composed of hyoscyamus and acetate of potash will be found very useful. I sometimes find the balsam of copaiba of great service in certain states of irritable bladder and urethra.

Rest and freedom from excess to be enjoined.

Whilst the patient is undergoing treatment, he must be enjoined to avoid every excess which may increase the circulation or heat the blood. It would be better, there can be little doubt, if he were confined to bed or

to the house during the treatment; but as this can only generally be effected with hospital patients, the surgeon must content himself with urging upon him as much quiet as possible. It will be absolutely necessary for the ensurance of a speedy and effectual remedy, that sexual intercourse should be abstained from. There will not be much difficulty in this matter with any right-minded and prudent patient. We shall frequently find that a stricture is most difficult to treat in the persons of newly-married men. The cases which have proved most obstinate in my hands were in such, and the cause is sufficiently obvious.

But above all, it is necessary that the patient should avoid all stimulating drinks; for nothing is more prejudicial, and nothing tends to irritate the urethra and bladder more, than wine or alcohol. The surgeon has frequent proofs of this fact, as by far the majority of cases of retention of urine are brought about by drinking large quantities of wine or spirits. Proof of this also is seen during the course of treatment of a case: for whilst the dilatation of a stricture is being easily carried on, an occasion will occur on which an instrument cannot be carried into the bladder without producing the most troublesome consequences, or even not at all; and on inquiring, the surgeon elicits from his patient that he has been drinking.

Stimulating drinks not to be used.

A patient of mine, who had been a naval officer, and was under my care with a very bad stricture, and was doing very well, called upon me one morning, and I proceeded to pass an instrument, which I had introduced with ease a few mornings previous; but, to my surprise, I found that so much pain and irritation was produced,

Case.

that it was necessary to give up the attempt. On questioning him closely, he very modestly confessed that he had imbibed *two bottles* of sherry the night before.

As a general rule therefore, when about to treat a bad case of stricture, I enjoin my patient to refrain entirely from stimulants. Plenty of water, both internally and externally, is a powerful adjuvant to the surgeon. Bathing, either in warm or cold water, is most beneficial. I therefore generally advise the patient to take a warm bath once or twice a week, either preparatory to or subsequent to instruments being used. If he prefers cold bathing, he can use this.

Case.

The case in which I have seen dilatation most rapidly carried on was in the person of a gentleman who had been attending at Dr. Gully's hydropathic establishment, who had such a bad stricture, that at first a No. 1 sound only could be passed with difficulty, and the urethra was very sensitive. At the termination of two weeks, I was enabled to pass a No. 12 sound into his bladder. Now, during the whole of this time, this gentleman had not taken one drop of wine or spirits, but had drunk copiously of cold water, and had employed the wet sheet, as advised by the practitioners of the water system. I could not help assenting to the opinion of my patient, that the rapid progress of dilatation was greatly influenced by the very liberal use of water internally and externally, or perhaps, more correctly speaking, by the entire abstinence from stimulants.

Period of day at which instruments should be used.

It is not an unimportant matter to attend to the period in the day at which instruments should be used. There is generally more or less congestion of the penis

and urethra after lying several hours in a warm bed: therefore, it is not so desirable to pass instruments early in the morning, but it is far preferable to use them either at mid-day or in the after part of the day. The best time, perhaps, is a few hours *before* retiring to bed.

State of temperature.

The state of the weather makes a difference with respect to the facility or difficulty of passing an instrument through a stricture; and it has often been remarked by writers that there is much greater difficulty in passing a catheter in cold weather than in warm. By referring back to the case of J. C——, p. 88, we shall see this point illustrated: it is therefore desirable not to pass instruments in very cold weather, or when the patient himself is cold.

What is the length of time which should be allowed to elapse between each introduction of an instrument? This is a question which requires some consideration, for much of the success of the treatment of a case depends upon the judgment which is displayed in reference to this point.

Intervals at which instruments should be passed.

As there is such a difference both in the nature of strictures and in the capability of the parts to bear irritation, it will necessarily happen that what can be done in one case cannot be effected in another. If the stricture is tough and cartilaginous, and if there is hardly any irritation of the urethra produced by the introduction of an instrument, the surgeon may with perfect propriety pass a bougie or catheter every other day, or even, if some pressing occasion exists, every day, more especially if by so doing it be found that the dilatation can be carried on with success, and a larger instrument can be passed through the stricture

every time. There are a certain number of instances in which this may be done; and when this is the case, a stricture will be dilated in a very rapid manner: but in the majority of instances it will happen that the very act of instrumental dilatation will produce an amount of irritation which precludes a speedy reapplication of the same means; and as the process of dilatation is not to be measured by the frequency with which instruments are passed, it is necessary to pause and ascertain what is the effect which is produced. If it is found that pain and irritation remain after passing the instrument, it should be laid aside until they have subsided, for it will be useless to persist under such circumstances. As a general rule, it may be stated that so long as any irritation remains, it will be better to delay until all these symptoms have passed by.

When a patient applies to a surgeon for the purpose of undergoing treatment for stricture, he has the idea that the oftener an instrument is passed, the more quickly will his disease be remedied. The surgeon even may hold the same view, and act upon it. But it is a great mistake, and a further experience will soon teach him that in the majority of cases a moderate use of instruments succeeds better than when they are employed very frequently.

Irritation sometimes produced by instruments.

There are some cases where the local irritation produced by the passing of an instrument is such, that it does not subside for several days. Now, if an attempt is made to pass a larger instrument whilst this irritation is going on, it will probably not succeed, or will only be accomplished by force, and with suffering on the

part of the patient; and I believe that in the way of teaching us caution, the irritation which is occasionally set up is beneficial; for it points out when we must desist from passing instruments, and to what extent it is right to go with them.

It will not only happen that in certain cases the dilatation cannot be carried on without difficulty and pain, but every now and then a case is met with in which one attempt alone at passing a catheter will be followed by such very severe symptoms, both locally and generally, that danger to life may be apprehended. I have mentioned such a case occurring lately in the practice of a friend of mine. Sometimes severe rigors, followed by smart attacks of fever, occur, and local inflammation, ending in abscess, takes place. If these circumstances happen, it will be necessary to abstain entirely from mechanical interference for a time at least; to inquire carefully into the patient's condition; and if this has not been done, to examine the urine with care, and, by appropriate remedies, to remove the irritability of the system. And when a next attempt is to be made, it will be judicious to place the patient in a warm bath beforehand, and, at the same time, to get him partly under the use of opium; and, above all, it will be necessary to be very gentle in the use of instruments.

I think it may be said as a general rule, that in the treatment of stricture of the urethra, with the exception of those cases where the contraction is very tough and the urethra not at all irritable, *twice* during the week will be sufficient number of times for the surgeon to

pass an instrument: but of course, as has been stated before, this will depend upon a variety of circumstances. However, it cannot be too strongly impressed upon the mind of the practitioner how necessary it is for the welfare of his patient to avoid all roughness and haste in using instruments of whatever description, and not to employ them at too short intervals of time.

Necessity of gentle measures.

CHAPTER VI.

TREATMENT OF STRICTURE BY PERMANENT DILATATION.

Definition of permanent dilatation.

ALTHOUGH stricture of the urethra is in this country generally treated by what is termed temporary dilatation, the method I have just been considering; and although in the greater number of cases temporary dilatation, when judiciously employed, with general remedial measures, will suffice,—it will be found that there are certain cases which will prove refractory to this kind of treatment; and for such cases it will be necessary to adopt some other method. This consists in introducing an instrument through the stricture, and permitting it to remain in contact with it for some length of time, either some hours or days.

The object the surgeon has in view when treating stricture by temporary dilatation is, by allowing the instrument to remain in the stricture for only a brief interval, to produce just such an amount of irritation in the parts as will lead to the absorption of the adventitious texture constituting the disease: in this way it is that, in all probability, a contraction of the canal is got rid of for a time. This absorption must necessarily be gradual: but there are circumstances which prevent it from being carried out; and when these obtain, a more rapid or more decided method must be pursued.

When an instrument is retained for some hours or days together in contact with a stricture, the continual

pressure which is excited produces a greater amount of irritation than is sufficient to excite mere absorption of the adventitious deposit. That which is perceptible to our senses tells us that something more is going on; for, after a few days, a discharge of a muco-purulent character takes place: this becomes more or less free, and finally is changed into a character more or less purulent. If no untoward circumstance arises, the instrument which has been introduced and allowed to remain in the urethra becomes more loose, and is easily withdrawn; one of a larger size can be introduced, and by degrees the capacity of the canal is so much increased that it is possible to pass a full-sized instrument. These facts indicate that something more than mere absorption is produced in this manner. We know that the constant pressure of a foreign body against normal or abnormal textures will produce not only absorption, but, if continued sufficiently long, ulceration and destruction of these tissues as well. The same kind of effect is produced by the retention of a catheter in contact with stricture; otherwise we cannot account for the symptoms which are produced by it, or for the effects which are recognised in respect to the stricture itself.

How permanent dilatation acts.

The permanent retention of an instrument is employed in cases where the stricture is permeable. John Hunter advocated its employment in certain cases of old and tough strictures which resisted ordinary measures; and he used to consider that the contact of the bougie produced ulceration of the stricture, and in this manner destroyed all traces of

it: for Hunter very justly observed that as the stricture is composed of an adventitious texture, its vitality is much inferior to that of normal tissue, and thus is much more easily destroyed.

But the cases in which the treatment by permanent dilatation is most useful are those where a small instrument can be introduced. It is true that, in the majority of such cases, ordinary dilatation may and does suffice: but, as I have before stated, there are individual instances which rebel against ordinary treatment; and certain circumstances every now and then obtain which preclude the surgeon from fairly carrying this out. I shall now endeavour to point out the conditions of the disease which require permanent dilatation, and those circumstances which may render it necessary.

Cases in which permanent dilatation should be used.

In the first place, then, as to the peculiar nature of the contraction which resists ordinary treatment and requires the constant pressure of an instrument. It may be stated that there are two forms—or, more properly speaking, three. The first is that in which the stricture has existed for a length of time, is so tough and resisting that dilatation cannot be effected in any reasonable amount of time: such a stricture is especially troublesome to treat by temporary dilatation when it is seated in the spongy portion of the urethra. The second condition is where the same kind of stricture exists, the cause of the malady, however, being different, the contraction being the result of a wound. Here, as has been before mentioned, ordinary dilatation will be found extremely inefficient; and it is to some of these cases of trau-

Three forms of stricture.

matic stricture that it will be found necessary to apply permanent dilatation.

The *third* form of stricture which proves rebellious to ordinary dilatation is that where the contraction is narrow, has existed for a long time, and defied numerous attempts to dilate it: but, above all, the characteristic of it is, that it is extremely irritable, and has a great tendency to re-contract after an instrument has once been passed through it. This is the form of stricture which has been so accurately described by Mr. Syme as the *resilient* stricture.

In these varied conditions of the disease, permanent dilatation will be found not only to be highly useful, but even absolutely necessary. In that state where the stricture is very indurated, the continual pressure of an instrument will do good by softening, and even destroying, the hardened texture; whilst in the last form, where the irritability and tendency to re-contraction are most observable, the main benefit is, I believe, produced by the retained instrument exciting that amount of irritation which, as it were, antagonizes and overcomes that already existing. Doubtless also, the process of softening, absorption, and even destruction of tissue, is effected here likewise.

Accidental circumstances rendering it necessary.

As to the accidental circumstances which prohibit temporary dilatation and require it to be permanent, it is now my duty to inquire into them. One of these circumstances which particularly calls for this kind of treatment is where *time* is of great importance. Many persons, from their peculiar avocations, cannot afford more than a few days or a week. An individual may be suddenly summoned to go abroad,

and, before he goes, may be most anxious to get rid of the miserable encumbrance of a bad stricture. He applies to a surgeon, and begs of him to adopt some method by which he may be effectually relieved in the course of a few days. In such a case as this, rapid dilatation, by permanent retention of an instrument, is called for.

As an illustration of the value of this permanent dilatation by retention of the catheter in an uncomplicated but severe case of stricture, where time is of importance, I will mention the following :—

Case I. Mr. G——, aged forty, a coast-guard officer, was brought to me by a practitioner whilst I was attending for Mr. Fergusson, in September, 1855. He had suffered for years from bad stricture, and latterly the symptoms had become so severe that he came up to London to consult some eminent surgeon. He saw a well-known hospital surgeon, who made attempts to pass small silver catheters; but the patient was put to very great pain, and bled so much that he nearly fainted, and determined not to go a second time. He then consulted the gentleman who brought him to me, but who could not succeed in passing an instrument. On examining the urethra, I found that the canal was not irritable, but that there was a very tight stricture at the bulb, into which I could get the point of a No. 1 silver catheter; and as the patient did not suffer much pain, and I felt sure that the instrument was in the right direction, I employed pretty firm pressure for half an hour, when the catheter passed into the bladder.

This gentleman told me that he had not more than a

short leave of absence, and was anxious to get well as soon as possible; so I advised him to lie in bed for a week, and undergo treatment by retention of the catheter.

This treatment was commenced so soon as he could make his arrangements. I used the silver catheter, changing the number from day to day. No undue irritation whatever was produced. The urethra became gradually dilated, and, at the end of the week, I left him under the care of Mr. Fergusson, with a No. 7 in the bladder. This latter gentleman then speedily finished the treatment by ordinary dilatation, and the patient returned to his duties very much gratified with the result.

This plan of treatment is also applicable to some of those more severe forms of the affection where perineal fistulæ exist, and a closure of these false openings may be brought about, especially when the contraction is not very narrow.

Case II. In the autumn of 1854, a gentleman, aged forty, of a weak habit of body, consulted me. He was in a very unfortunate condition; for he had a large opening in the perineum, the result of a stricture and a subsequent abscess. He had been under the notice of a surgeon in the provinces, who had advised him to come to London to undergo a cutting operation. I doubt not, this patient would readily have assented to any operation to which I chose to subject him; but on examining his urethra, I found that it was permeable to a No. 5 catheter. I set about dilating the stricture, which in a short time admitted a No. 8 gum-elastic catheter. I then recommended the patient to lie in bed, and keep the catheter

retained in the bladder. The instrument did not produce any serious irritation; the canal became fairly and fully dilated, and in the course of a few weeks the fistulous opening had closed up. In the treatment of such a case by retention of the catheter, it is advisable not to permit the patient to pass any water except through the instrument, as the insinuation of the urine into the artificial opening would retard the cure.

There is still another circumstance which as promptly calls for the rapid dilatation of a stricture. This is where a patient is suffering severely from symptoms of stone in the bladder, and requires to undergo without delay the operation of lithotomy or lithotrity, and yet at the same time a tight stricture of the urethra is present. Here rapid dilatation is called for—in some cases most imperatively—because it is necessary that the canal of the urethra should be opened up thoroughly, to allow of the introduction of the sound or lithotrity forceps.

Two methods of employing permanent dilatation.

There are two methods of employing permanent dilatation, which considerably differ from each other, although the effect sought to be gained is identical in each, and the manner in which that effect is produced is perhaps much the same. In the one mode of proceeding just illustrated, an instrument is passed into the bladder through the stricture, and kept there for a period varying from one to four days. At the end of this time, a larger instrument is passed, and kept there for a similar length of time; and then the process is repeated, until, after the space of two or three weeks, the canal of the urethra, if circumstances go on favourably, becomes fully opened up. This is the method which is for the most part adopted in this country in cases where there is both

Slow.

opportunity and time for the patient to undergo it. It is what the French surgeons call *dilatation permanente lente.*

Rapid.

The other method is that which is termed by the French, in contradistinction to the last-named, the *dilatation permanente rapide.* To carry on this process, the surgeon first passes an instrument which, with some little pressure, can be made to traverse the stricture. This is permitted to remain in the bladder for the space of four or six hours; it is then taken out, and another of a larger size is passed; and the same thing is repeated, day after day, until the urethra is completely opened up. In this instance, the same effect will be produced in the space of a week as can be accomplished by the other form of permanent dilatation after the course of two or three weeks; therefore the more brusque method just described is only advisable where but a few days can be devoted to treatment.

Instruments to be employed.

The instruments which should be employed for being retained in the urethra are either the gum-elastic or silver catheter, and the choice of either must depend upon the nature of the case, as upon the precise plan of treatment which is to be carried on. When the stricture is very hard and tough, and it is necessary to adopt the more speedy method of dilatation by changing the size every few hours, it will be well to use the silver catheter, as the contact of a metallic body with the indurated tissue will be much more effectual than when the instrument is less resisting. If, however, it is thought preferable to try the slower method of treatment, it will be advisable perhaps to employ the gum-elastic catheter:

these are more convenient for patients to wear for any length of time in the bladder.

Precautions necessary in employing it.

When *permanent dilatation* is being employed, it will be prudent to keep the patient perfectly quiet in bed, or at least confined to a sofa: and, above all, it will be necessary to enjoin the most strict precautions relative to the use of stimulating drinks; for if accidents are liable to happen during even the milder plan of *temporary dilatation*, they will be much more likely to obtain when an instrument is in constant contact with the urethra.

Accidents likely to happen during the treatment.

The circumstances which happen to prevent the effectual carrying out of this plan of treatment are the following:—In the first place, the patient may be entirely unable to bear the catheter within the urethra for any period of time beyond a few minutes or hours. This, however, is a comparatively rare circumstance; and then even it may probably depend upon causes which, if inquired into, may be remedied. A striking instance of this kind occurred to me last year. A gentleman who had been under treatment, more or less, came to see me, as his stricture had not been attended to for some time, and he was suffering very severely. On examination, the contraction was found to be existing only about one inch and a half from the meatus; and although it was in this situation, great difficulty was experienced in introducing any instrument. On one or two occasions, however, I managed to introduce a small silver catheter; but the patient was so exceedingly sensitive to the necessary manipulations, which were somewhat prolonged, that I advised him

Case III.

to undergo treatment by retention of the catheter. On my first visit to him at his own house, I was enabled, after some careful manipulation, to pass a No. 3 silver catheter: this was carefully fastened and retained. The patient was enjoined to keep perfect rest. On visiting him next day, I found, to my great annoyance, that the patient had not been able to retain the instrument more than two hours, the irritation being so great that he was compelled to remove it; and unfortunately, on attempting to re-introduce an instrument, I found I could not pass anything through the stricture; and the results were that so much local irritation was produced, that an abscess formed in the penis, and the patient was confined to his bed for a much longer period than the treatment by permanent dilatation would have occupied, could it have been borne. In this case I would have used a gum-elastic catheter, but I could not introduce one.

Irritability of the bladder may be excited during the time the catheter is retained, indicated by increasing and frequent desire to pass water, by bloody urine, and by frequent erections, accompanied by seminal emissions. Swelling of the testicle also is produced; and besides these local signs, a severe irritation of the whole system is sometimes brought on—the patient becomes feverish, loses his appetite, passes restless nights, and visibly loses his nutrition. When these or any other circumstances obtain, it will be necessary to take out the instrument, and to correct the morbid state of the system which in some form or other exists. Some perverted condition of the urine itself will probably be found to obtain, and

those remedies which correct this state must be used, the action of the principal secreting organs must be inquired into and rendered more healthy. Opiates and the warm bath especially will be found eminently useful in allaying irritation, and in assisting the treatment. When the irritation has subsided, the dilating process may be again commenced and carried on with caution, but certainly not before.

Wakley's instruments.

There is another method of treating stricture by a species of rapid dilatation, which has of late been practised by Mr. Thomas Wakley. It is, indeed, chiefly a modification of the plan devised by the French surgeons; and the instruments which are used are most ingenious, and calculated to dilate the urethra rapidly. They consist of a conducting rod or wire, of tubes of silver of various sizes, and of gum-elastic material. They are used in the following manner:—The conducting rod is first passed through the stricture into the bladder; and upon this one of the smaller silver tubes is carried, so as to dilate the stricture forcibly and rapidly. By this means the stricture can be so opened up, that the tubes can be introduced and increased to one or two sizes; so that where, at the commencement of one sitting, only a No. 2 could be admitted, the operator may be able to introduce No. 4 or No. 5. A gum-elastic tube of the same size as the one of silver last passed is finally introduced and left in the bladder for some hours; and on the next sitting the size of the silver tubes is increased, so that the stricture becomes dilated in a rapid manner.

How used.

Case.

I have only had personal observation of a single case treated by means of these instruments, and therefore it would be out of place for me to give an opinion upon a

mode of procedure about which I know so little. In the case which was under my notice, the duration of the treatment was, I fear, prolonged; at all events, it was by no means shortened. It was certainly a very bad instance of stricture for any treatment; it being caused by a local injury. There was not any difficulty in passing the conducting rod, and two of the tubes were passed over it without force, and afterwards the gum-elastic catheter was retained in the bladder; but much local and general disturbance was produced by this rapid dilatation, and the patient was kept in bed for more than two weeks, and then dilatation could not be effectually practised. It was not by any means a satisfactory case. Mr. Wakley, however, speaks highly of this mode of treatment, and therefore we are to presume that it has answered the expectations he had held out to himself and others.*

Objections to rapid dilatation.

The grave objection to rapid dilatation is, that there is a chance of producing irritation, spasm, and bleeding in the urethra; and that even after the stricture has been pretty well dilated, there is so great a tendency in the part to assume contraction: and I believe it may be looked upon as a truthful maxim, that the more rapidly a stricture is dilated, the sooner is re-contraction likely to occur. Every surgeon who has had much to do with stricture cases, knows that he

* Since this was written, I see that Mr. Hutton, the eminent surgeon of Dublin, has informed the profession that he has for many years past used instruments constructed on a similar principle with those used by Mr. Wakley, and calculated to effect dilatation in a like manner. The conductor in Mr. Hutton's instrument is, however, flexible.

is obliged to be very careful, in the course of treating strictures by dilatation, to avoid attempting to dilate too rapidly; for if he increases too suddenly the size of the catheter or bougie, he will almost invariably, in an irritable subject, excite so much sensitiveness and pain, that it will be necessary to lay aside the use of instruments altogether for a week or ten days. Thus, in reality, the course of treatment, instead of being shortened, will be carried over a longer extent of time.

Still, there are some cases in which I can easily suppose that rapid dilatation by the use of these instruments may be beneficial; such, for instance, as hard, unyielding contractions which are not irritable, and which are very obstinate to ordinary dilatation. Moreover, in certain cases where a false passage exists, if the surgeon can feel certain that he can carry the conducting rod along the natural course of the canal, these instruments would, I apprehend, be very useful.

Mr. Holt, of the Westminster Hospital, has also brought into notice an ingenious instrument for rapid dilatation. Holt.

CHAPTER VII.

TREATMENT OF STRICTURE BY CAUSTICS.

Reasons why caustics are sometimes required.

I HAVE hitherto considered those methods of treating stricture which are most usually adopted in this country; and it has been shown that *dilatation*, either temporary or permanent, is, for the most part, only suitable in those cases where an instrument of some kind can be introduced through the stricture without force; and the majority of cases are those where the obstruction is not *impermeable* to an instrument when cautiously and patiently used. Still, every now and then we shall meet with an instance where, either from the patient's fear or neglect, the disease has been allowed to become so bad that the surgeon cannot pass any dilator without exerting an unwarrantable amount of force. In the mean time, the patient is suffering most severely from the effects of his malady, and is urgent for relief. In such a case, it is necessary to employ some other method by which the contraction may be overcome, and the mischief which is going on be stayed in its progress. Then again, it has been seen that cases are met with, in which, although a small instrument may be passed, there is such a difficulty in carrying on dilatation, either from the density or irritability of the stricture, that the surgeon is compelled to resort to some other remedial means, which either prepare the way for dilatation, or assist

this process when once it has been commenced. Fortunately, these means exist in the form of *caustics*.

The caustics used.

The surgeons of some centuries since used to employ certain agents for the purpose of destroying the so-called callosities and carnosities of the urethra. Of late years, two agents have mainly been used for applying cauterization—viz., the *nitrate of silver* and *potassa fusa*.

Nitrate of silver.

Wiseman.

Hunter.

Wiseman was, perhaps, the first English surgeon who used nitrate of silver; but it was not until John Hunter revived its employment in cases of stricture, about the middle of the last century, that cauterization became much adopted. Most surgeons have read his case of the chimney-sweeper, where, after having tried for six months with the bougie to obtain a passage, he had recourse to the nitrate of silver, by passing it on the end of a wire through a canula. After touching the stricture four times with it, he was enabled to pass an instrument into the bladder, and soon cured his patient. This success led him to adopt the method in several other cases; and the following was his statement in reference to it:—"I have seen several cases where it was thought necessary to follow this practice; and it succeeded so well, that after a few touches with the caustic, the bougie could be passed, which was all that is wanted."* After his time, Sir E. Home used the nitrate of silver very freely, and found it a very useful agent; but, to such an extent did he employ it, that considerable mischief was produced; and, since his time, the use of caustics has been much abandoned, and a great share of obloquy has been thrown upon them.

E. Home.

* Hunter *On the Venereal*, p. 185.

Potassa fusa.

About the beginning of the present century, the caustic potash was first brought into notice in this country, as a remedy in some forms of stricture, by Mr. Whately, and was employed to some extent by that surgeon, by Sir C. Bell, and others; and more lately, this agent has been warmly advocated by my colleague, Mr. Wade, who has published many cases in which it was successfully used.

Whately.

C. Bell.

There can be no doubt whatever that both these caustics can exert a considerable influence on a stricture of the urethra; but they act in a different manner. Every surgeon has occasion to witness the effects which nitrate of silver produces upon diseased states of the tegumentary tissues. When applied, for instance, to warty excrescences about the anus and scrotum, it will rapidly cause their removal by a process of absorption; and a free application of the same agent to the surface of very painful and irritable ulcerations will often diminish the morbid symptoms, and cause the sores to put on a healthy appearance. By a like process of absorption, and as a destroyer of irritability, does nitrate of silver act in cases of stricture. When, therefore, a fair trial has been given to the bougie or catheter, and no impression is made upon the obstruction, the nitrate of silver may be used, and, after some applications, the stricture will probably be penetrated; but experience has taught surgeons that it is not so beneficial in destroying the stricture as in removing the irritability which, in certain instances, obtains, and prevents dilatation. In some cases, every attempt to pass an instrument, however gently, will produce so much pain, that the patient cannot bear the process

Effect of nitrate of silver on stricture.

Useful chiefly in removing irritability.

In such, if, after having remedied the abnormal condition of the urine which may exist, or having corrected the disturbed state of the system, no benefit appears to have arisen, a great amount of good may be effected by lightly touching the surface of the stricture, whether impassable to an instrument or not, with the nitrate of silver. In the course of a day or two, the bougie or catheter may be tried again; and if the agent has had the desired effect, the irritability will be destroyed or lessened, and the obstruction will be entered or passed through. But several applications may be necessary before any decided good will accrue; and although the agent will, when applied cautiously, generally have the desired effect, it will sometimes increase the irritability already existing; therefore it cannot be depended upon always. I have not used the nitrate of silver to a great extent, but I have seen enough of it to know that it may produce very excellent effects in allaying irritability; and as it is now pretty universally acknowledged that it should be occasionally used in the treatment of irritable strictures, I shall dwell no longer upon this subject, but at once proceed to consider the employment of *potassa fusa*, upon which there is much difference of opinion.

Sometimes increases it.

By far the most powerful agent of the two is *potassa fusa;* and it is a remedy which is used more frequently in these days than it was a few years ago, but its value is not yet recognised by many. About the beginning of the present century, Mr. Whately brought it into notice as a remedy in certain forms of undilatable stricture. It was tried pretty extensively; but after a time it was given up, and had nearly fallen into

Potassa fusa.

Wade.

oblivion, when Mr. Wade called the attention of surgeons to its use. He published in his work on Stricture many cases of its success; still, surgeons, of repute even, not only shrink from employing the potassa fusa in stricture, and throw doubt upon it as an efficient agent, but they actually deny that it has the power of destroying a stricture, and affirm that it creates more mischief than was produced by the original disease.

Subject of much discussion.

As is well known, the subject of treating stricture by various methods has been strongly discussed by some surgeons during the last few years; and, amongst other points, the presumed efficacy and expediency of using potassa fusa has been not only inquired into, but has been strongly called into question. One

Syme.

of the greatest authorities in Great Britain, Mr. Syme, of Edinburgh, a surgeon to whom we are all indebted in no small degree, has anathematized its use in no measured terms; but his strong language has, perhaps, been the means of inducing practitioners to test the efficacy and safety of the agent: certain it is, that more surgeons have employed it within the last few years; consequently, one is the more able to come to some definite conclusion as to its value. I my-

Author's prejudices against it.

self was one of those who was strongly opposed to the employment of potassa fusa, merely because I had heard many objections against it, and had not had sufficient opportunity of observing its action; but since I have had my attention more particularly drawn to the subject of stricture, I have inquired closely into the merits of this agent as a remedy in certain inveterate cases of the disease, and find that it ought by no means to be rejected. I shall, therefore, now go

on to consider its action, its effects, and the kind of cases to which potassa fusa is more especially applicable.

How it acts.

When potassa fusa is applied to the living tissues of the body, it rapidly induces sloughing and destruction of the part; and, if not kept within due bounds by some agent, its action is more or less diffuse. Nevertheless, we must not judge from seeing this effect on the healthy skin, that the same is actually produced on the adventitious texture in the urethra; for if it were so, it would indeed be the dangerous remedy which it is affirmed to be by some.

It is in consequence of having taken this narrow-minded and prejudiced view, that some have attributed to it such dangerous effects; whilst, on the contrary, I have heard it publicly stated by a well-known surgeon at a medical society, that because potassa fusa is dipped in oil before it is applied to the stricture, it cannot have any effect whatever upon it. We shall be the more able to appreciate the effect of this agent upon a *stricture*, if we study its action upon other diseased tissues. Let us take, for instance, the mucous thickenings which are seen upon the lip or tongue: if the potash is applied to these enlargements once or twice, gradual absorption, or at least diminution, of the tissue takes place, without any actual breach of surface being produced.

Its effect on stricture.

When it is applied to the face of a stricture, it acts, I believe, in *three* ways. *In the first place*, when gently applied, it has an effect somewhat similar to that which nitrate of silver has: it diminishes the irritability which renders the urethra so sensitive, and thus allows a bougie to pass, when it otherwise would not. *Secondly*, when applied more freely, it has the effect

noticed on mucous tubercles: it excites an amount of irritation sufficient to produce actual absorption of the thickened tissue; and to this effect, I think, must its beneficial action on stricture be mainly attributable.

Destroys stricture.

The *third manner* in which, in my opinion, the caustic potash acts upon a stricture, is by producing actual *destruction* of the thickened tissue itself. We know that when it is applied to the sound skin, or to the surface of a granulating ulcer, without the intervention of any oleaginous substance, it will readily destroy the superficial portion of the texture to which it has been applied, and a slough will be produced. As, however, the agent is never, or at least ought never to be, applied to the urethra without being covered with oil, or ever applied with such freedom, the same degree of effect is not produced; for the alkali of the potash combines with the oil and mucus of the urethra, and forms a soapy compound, which diffuses itself over the canal: consequently, it happens that the mischief which would otherwise ensue is prevented. The caustic acts only with energy upon the surface of the stricture, or that portion of it to which it is applied. This action is much lessened by the oil: nevertheless, actual destruction of a small part of the stricture, in all probability, takes place on each application. I am aware that some surgeons do not believe that potassa fusa actually destroys the stricture, and thus do good. Mr. Wade states that he has never observed a slough pass away after the use of the agent, and thus inclines to the belief that it does not destroy tissue; but still I see no reason to doubt that it has some destructive agency upon a stricture, knowing, as we do, its powerful effect

upon other tissues; and I think the effect which is produced after a free application to a stricture can hardly be explained upon the principle of absorption alone. But, before going further into this point, I shall describe the effects which are produced by the application of the potash, and then it will be more easy to understand its action.

Sensations produced by it, when applied to the urethra.

When applied gently, it produces a sensation of heat which hardly amounts to pain; and if the potash is pressed up against the stricture for the space of half a minute or so, the patient suffers some degree of pain; but this amount depends upon the nature of the stricture, and upon the irritability of the urethra. In some cases, I have noticed that but little pain is experienced when it is very freely applied; but in the majority of persons it is considerable, and it lasts for a few minutes after the bougie has been withdrawn, and then disappears until the patient has to make water, when more or less disagreeable sensation is produced by the urine flowing over the surface with which the caustic has been in contact. Soon after its application, a discharge takes place of a mucous or muco-purulent character; and this is kept up for some two or three days, and then gradually ceases. All these effects are heightened when the caustic is applied freely, and the surface of the stricture is irritable. The pain at the time it is applied is sharpish, and it increases as long as the bougie on which the potash is inserted is pressed against the stricture, and remains for a longer period after it has been applied; and when the urine is passed, the patient suffers considerably; the discharge also is much thicker, dark-coloured, and mixed with blood. If the caustic has been applied very freely, an abundant

When gently used.

When too freely applied.

discharge comes away directly after the bougie has been withdrawn; sometimes a considerable discharge of blood takes place. If the potassa fusa has been applied with an unwarrantable severity, these effects are enhanced to a great degree: pain is excessive, shooting along the urethra and extending over the perineum; complete retention of urine occurs, a copious muco-purulent and bloody discharge is kept up, and the patient is thrown into a state of general fever. Still, however, its application should never be made so freely as to produce these very severe effects. In some cases the effects will differ very much in the same person, even though the agent be applied in a similar manner: this, of course, will depend upon the condition in which he is at the time the caustic is applied. In the case of a gentleman, which I shall presently have to relate, it will be seen that, when I applied it on the first two or three occasions, great suffering, and even retention of urine, was caused. At this time the patient was in a bad state, both from the effects of his stricture, and from an irritable condition of the system, produced by irregular habits. But in a few weeks I had occasion to apply the caustic as freely as before two or three times, and, to his great surprise, there was neither pain nor retention of urine. This immunity from suffering depended upon his system being in a healthier condition; for between the first and last applications he had an attack of gout, which necessitated perfect quietude and entire abstinence from stimuli.

Retention of urine is sometimes produced by the potassa fusa; but when it is cautiously applied, I believe it is rare to meet with retention; and most

surely I have as often, and even oftener, met with retention of urine after the introduction of a bougie or catheter: indeed, I have met with cases of stricture in which attempt after attempt, however careful, has been followed by this accident; and in those cases where retention has been the result of caustic, in all probability it would have ensued upon the use of any dilating instrument. But, on the other hand, I have noticed that retention of urine has been prevented by the use of potassa fusa—that is to say, every attempt to pass an instrument has been followed by retention; but in the same person, when the caustic was applied, none such occurred.

Cases where potassa fusa is applicable.

Without at present dwelling at any further length upon the ill results which have been stated to follow the use of potassa fusa, or delaying to answer the several objections which have been advanced against its use, I shall at once proceed to consider the cases to which it is applicable.

There are two well-known conditions of stricture in which potassa fusa is employed, and in which its use is followed by very beneficial results.

Impassable stricture.

The *first* is where the stricture is so narrow, that although it allows the urine to dribble through, it is impermeable to an instrument without the use of unjustifiable force. This impermeability to instruments has been denied by Mr. Syme; nevertheless, all surgeons have not had the singular good fortune to succeed in introducing an instrument through a stricture whenever they have made the attempt; and most certain it is that, every now and then, cases are met with where repeated trials with the smallest catheter fail. More-

over, the reiterated attempts only tend to render the case more difficult: the irritation which has been excited is such, that the urethra rejects the most gentle introduction of an instrument; perhaps even laceration of the mucous membrane has been produced, and on every attempt the instrument used is arrested. By degrees, the condition of the patient becomes very much aggravated; the urine comes away with great difficulty, perhaps only in drops, and only then after excessive straining. The bladder gets into such an irritable state, that the subject of the malady is compelled to get up every hour in the night; and if he has gone to any excess, he gets complete retention of urine. The general system also suffers much; a state of constitutional irritation is excited, and the patient is rendered very miserable.

It is true that there are many cases of apparent impermeability—where these bad effects of neglected stricture are all forcibly realized—which are overcome by the cautious and patient use of instruments: indeed, very many patients, especially among the poorer classes, do not apply for advice until the urethra has become so contracted that hardly any passage exists; yet a great number of such cases may be effectually put to rights by dilatation alone. Still, the surgeon will now and then find himself baffled in every trial to get a catheter through the stricture; or he may get it into the bladder once by some lucky hit, and yet afterwards be foiled time after time. During these attempts, the patient is getting worse, both bodily and mentally; and even if he is still willing to submit further to the pain and inconvenience of repeated attempts to dilate the stricture, his

affairs may shortly take him away, and his time may be pressing.

Its good effects in impassable stricture.

In such cases, then, will the potassa fusa be found an efficient and speedy remedy when it is used with caution, and when it can be borne pretty readily by the patient; and it will be surprising to see with what comparative ease an impermeable stricture may be opened up. In many of these cases, the disease has lasted so long, and the urethra has been so irritated, that extensive induration of the diseased part exists; and if the contraction be situated at the spongy portion in front of the scrotum, the thickened tissue can be felt with ease outside. In other cases, although the stricture may be impermeable, there is not the same amount of induration. In the latter, one application alone of the potassa fusa may suffice to open up a passage; but in the former condition several applications are necessary. Much, however, will depend upon the state of the urethra, and upon the ability of the patient to bear treatment, as well as upon the freedom with which the agent is applied.

In *permeable* and undilatable stricture.

The other form of stricture to which the potash is applicable is where a small instrument can be passed, but, nevertheless, dilatation cannot be carried on with any degree of satisfaction or certainty. This may arise either from the induration of the tissue forming the stricture, or from the irritability of the part. When the latter exists, the potassa fusa, as well as the nitrate of silver, will do much good by correcting the irritability; but it is in the former condition that the agent will so much assist the surgeon in his endeavour to dilate: in fact, it was only in such cases that the late Mr. Whately used it, so that it might be applied to the whole

length of the strictured portion of the urethra. And others have considered that caustic should only be used in instances where an instrument could be passed, so that, if retention should ensue from its application, a catheter might be introduced to empty the bladder. Although, in irritable stricture, the nitrate of silver acts very beneficially, it sometimes fails to do good; and then it is that potassa fusa may be tried, and it will frequently answer the best expectations of the surgeon.

In stricture complicated with urinary fistulæ.

But there is another form of the disease in which the potassa fusa is of great service; and that is where there is inveterate stricture complicated with fistula and concomitant induration of surrounding parts. Hitherto it has been for the most part thought that this condition could only be remedied by a cutting operation; and, indeed, there can be no doubt that it can be effectually remedied in this way: but if the surgeon can dispense with the knife in dealing with a stricture, so much the better; and as the great point is to make a free passage for the urine along the urethra, and as this can be effected by the potassa fusa, the foundation for the cure of fistulæ will be laid, and the knife will not be requisite.

Mr. Wade, in his book on Stricture, mentions one very interesting case, in which there was impassable stricture and perineal fistulæ: nevertheless, after the application of potassa fusa on several occasions, the stricture was removed, the urine came away by the natural passage, and the fistulous openings were, after a time, completely closed. I shall have occasion also to relate a like instance.

Although I believe it is possible to remedy some of the cases so effectually by potassa fusa, that the fistulous

openings will entirely heal up, I am by no means so prepossessed in favour of the agent as to suppose that it will be of use in the majority of those old cases of stricture complicated with urinary fistula; for the tissues are much changed from their normal state, and an immense amount of thickening usually exists along the urethra. In some cases moreover, the sinuses have remained so long, that they become very hard, and are lined with a regular membrane; so that they will not heal except they are laid freely open. Even if the potassa fusa enables the surgeon to penetrate the stricture and get into the bladder, the surrounding induration of the tissues will not disappear, neither will the sinuses close up. The knife, and that only, will effectually remedy these bad cases. But if the fistulous openings have not existed long, and are not very extensive, a cure may be effected if the obstruction in the urethra is removed by the caustic.

Sometimes inefficient in urinary fistulæ.

I shall now describe the manner of applying the potassa fusa to a stricture. Various instruments have been used, so that it may not touch any other than the diseased portion of the urethra. These are composed of a canula, containing a rod, at the extremity of which is a contrivance for holding the caustic, and which may be protruded at will. But the method which I have seen adopted, and which I invariably use, is its application on the common wax bougie.

When it is to be applied to a stricture, it is well first to pass a bougie of moderate size down to the stricture, so as to ascertain the exact distance of the same from the meatus. A nick is made on the bougie with the finger-

Mode of applying it.

nail to measure this. A piece of the inside of a stick of *potassa fusa*, about the size of a large pin's head, is now taken and introduced into the extremity of another bougie, into which a small hole has been made by the end of a knife or a blade of a forceps. The caustic is well put in, and the edges of the cavity in which it is contained are well pressed around it, so that it should only be slightly prominent. The distance of the stricture from the meatus is now measured by comparing it with the bougie first passed. The extremity of the armed bougie is now dipped in oil, and it is introduced pretty rapidly into the urethra until it arrives at the stricture, against which it is lightly pressed for the space of a few moments or more, according to the nature of the case; it is then quickly withdrawn, and, on examination, the greater part or the whole of the potash is found to have disappeared.

Cautions necessary.

If there is the least obstruction to the passage of the bougie, it should be slightly withdrawn and then urged on, or it may be gently revolved between the finger and thumb: in this manner it will, without trouble, be carried against the stricture. But if the instrument becomes obstructed before it reaches the stricture, care must be taken not to continue the pressure, as it may have entered one of the lacunæ, and the caustic would injure the healthy urethra. It has been objected to this method of applying the caustic, that the sound portion of the canal would necessarily be damaged; but if great care is taken not to let the potash project much from the point of the bougie, and if the edges are well moulded around it, there need be no fear of its doing harm, the more especially if the bougie is well and dexterously introduced along the urethra.

After the *potassa fusa* has been applied, it is well that the patient should keep perfectly quiet. I generally advise him to take a warm bath, and, if possible, to retire to bed: for this reason, it is best to apply the agent in the evening. The patient should invariably be requested to make water just before the operation, so that there may be no occasion to repeat the act until some hours have elapsed; for after the caustic has been used, there is generally more or less pain experienced in passing water.

Period of repetition.

What period of time should intervene between the applications? This, of course, must depend upon two circumstances—the amount of sensibility of the urethra, and the nature and extent of the stricture. In some instances the irritability of the urethra is very great, and the patient ill bears the caustic. In such it will be necessary, before using it a second time, to wait as long as a week, or even more; and in other instances, where there is but little pain produced, it may be re-applied on the third or fourth day—generally speaking, in no cases before this time has elapsed. At any rate, it is most advisable to wait until the irritation of the preceding application is removed.

In some cases it will be only necessary to apply the potash once: this will suffice if the stricture is a short one, or when it is merely locked up, as it were, by spasm. In other cases two applications will be required; and in others repeated operations will be necessary, especially where the stricture is long, hard, and insensible.

Before resorting to a second application of the *potassa fusa*, a small unarmed bougie should be used, because the one touch may have sufficed to open up the stric-

ture, and thus render the further use of the armed bougie unnecessary; but, generally speaking, the earliest indication of the caustic having fairly done its work is afforded by the armed bougie somewhat suddenly going through the obstruction quite into the bladder: in fact, this takes place in some cases so suddenly and so unexpectedly, that the surgeon may be fearful that the instrument has penetrated some false passage, or anywhere but in the right direction. However, he is very soon undeceived.

I have before stated that more or less discharge of a muco-purulent character follows the use of the potassa fusa. This is naturally disagreeable to the patient, but it indicates that the caustic is having its proper effect upon the stricture; and my own experience has shown me that the more discharge there is, the greater likelihood there is of the potassa fusa being more speedily influential for good.

Marks of its efficiency.

If the caustic is having a beneficial effect, the first symptom of it will be apparent to the patient in his being able to pass his water more freely, and in a better stream; and this increased power of urinating will the more evidently depend upon the effects of the potash, if, on introducing the bougie a second time, it is found to pass along the urethra a quarter or half an inch further. This shows, especially when the stricture is of some extent, that a portion of it, at least, has been opened up.

Striking relief to symptoms.

When the stricture has been penetrated, the caustic is no longer necessary in the majority of cases, for the relief to the patient is most striking. The after treatment is most simple, and is just the same as if the

stricture had not been impermeable. Simple dilatation is what is now to be depended upon. There are some cases, however, where, although a bougie may pass, the stricture is with great difficulty dilated; and then it will be advisable to apply the potassa fusa again, so that the entire length of the diseased tissue may be touched by it.

Evil effects of potassa fusa.

It would not be fair to speak of these good effects of the *potassa fusa* without referring to the evil results which may be produced by it. The agent is accused by many of producing great mischief, and therefore some surgeons altogether reject it. It would be folly to suppose that so powerful an agent could be used to any extent without some evil results following. A careful observation of the effects produced by it on the urethra is sufficient to tell the surgeon that potassa fusa *can* do a deal of harm. Still, from what I have observed, it is my impression that, if great precaution is taken in using it, there need be no fear of serious mischief. The following are the accidents which may arise from its employment: *retention of urine, hemorrhage, false passages, perineal abscess.*

Retention of urine.

As to retention of urine, I have undoubtedly seen it occur after the use of potassa fusa—when, indeed, it has been freely applied, and when the patient has been very irritable, and his system out of order; but I have quite as often, if not more often, seen retention occur when only a catheter or bougie has been passed into or through a stricture. Moreover, I have seen retention prevented by the caustic in the same individual who almost invariably suffered from it after a common catheter had been passed; thus showing that

it is not so liable to produce it in some cases as an ordinary instrument is.

Hemorrhage.

As to *hemorrhage*, I must confess that, in my own cases, I have never seen any sufficient to give me alarm ; but that a very free application of so powerful an agent might produce severe hemorrhage, cannot be denied.

False passage.

The next charge—viz., that of its injuring the urethra, by getting into one of the lacunæ, and making a false passage,—is perhaps a more serious one, and it is an accident very likely to happen ; for if a laceration of the urethra should already exist, the point of an armed bougie may with facility be passed into it, and great mischief might be produced. But it appears to me that this accident—or, rather, its possible occurrence—should not be held as a valid objection to the use of potassa fusa : for, in the first place, if a false passage is known to exist, it will be best not to employ the agent at all, or, at all events, it would be wise to wait until the laceration should have had time to heal ; and if it is thought necessary and prudent to use it, more than ordinary precaution should be adopted, and a bougie to fill, or nearly fill, the canal should be employed. I have not seen any evil results of this nature happen, although in one case of very bad stricture, where I employed the potash, a false passage existed ; but, nevertheless, with taking great care I was able to escape it.

Perineal abscess.

Abscess in the perineum is the other accident which is charged against the use of *potassa fusa ;* and it is not difficult to understand that this may happen. When we bear in mind that an attempt to pass a catheter through a stricture may be followed by suppu-

ration in the perineum, it is not a matter of surprise that the same thing would occasionally occur after the employment of a bougie armed with caustic potash. I cannot, however, state that I have been able to trace distinctly the formation of an abscess to the use of potassa fusa. There is one case I shall have to relate, where there certainly was the complication of abscess and subsequently of fistulæ, and here I had applied the potash twice; but it will be found by referring to the case, that there was the appearance of abscess forming before I took the case in hand, and that it was only *not prevented* by the caustic. Still, in order not to conceal any of the ill results which may have apparently happened in my hands, I shall relate the case fully, so that the reader may be able to draw any deduction from it he pleases. I shall dwell no longer upon this subject, but shall at once proceed to relate some of my own experience and observation of the use of potassa fusa; and from this I think it will be seen that I am not disposed to agree in the assertion of Mr. Syme, that "a real organic stricture cannot be removed by caustic," or that, "on the whole, it seems more reasonable to conclude that, in the cases of alleged cure by caustic, there was no real stricture in existence, than to suppose that so improbable, or rather impossible, an achievement had been accomplished."*

Case I. Henry G——, ætat. thirty, married, was sent to me at the Westminster General Dispensary, February, 1853, by a surgeon who had had him under treatment for stricture for some time, and had endeavoured in vain to

* Syme *On Stricture of the Urethra*, p. 53.

pass instruments into his bladder. On examination, I found that he had an extremely tight stricture at the bulb, through which it was not found possible to pass any instrument. He was only able to pass his urine by drops, and he was continually rising in the night for the purpose of making the painful attempts.

March 4th.—I applied a small piece of caustic potash gently to the face of the stricture by the means of a wax bougie.

9th.—The caustic application was followed by some pain, which, however, did not last long. He passes his water much better. I applied it again, and ordered some Dover's powder at night.

11th.—Passes water much better: I therefore introduced a No. 4 silver catheter very carefully down to the stricture, and was enabled to get through it into the bladder.

16th.—Passed No. 6.

21st.—Passed No. 8.

April 1st.—Passed No. 10; after which he gave up attendance.

I have related this case first in a brief manner, because it well illustrates the safety and efficiency with which potassa fusa may be used. Moreover, this one is a type of the least difficult and complicated cases in which this agent is employed by myself; for, as has been seen, there was nothing, except the mere difficulty of passing an instrument, to render it rebellious to ordinary treatment: consequently, only two mild applications of potassa fusa were necessary, and then the urethra was opened up in a remarkably short time. Possibly and probably, a continuous use of catheters

might have sooner or later proved successful here; but as many attempts had already been made by a surgeon to dilate the stricture unsuccessfully, and as the patient was suffering most severely, I thought it better to apply the caustic at once.

I shall now give the details of a case widely differing from this last.

Case II. Captain A—— was first seen by me January 5th, 1856. He was about thirty years of age, and delicate. First suffered from stricture ten years before, and had consulted various eminent surgeons at home and abroad, but has neglected himself very much: consequently, his sufferings have been great; and they increased so much within the last few months, that he placed himself in the hands of an eminent hospital surgeon about three weeks since. This surgeon managed to get a No. 2 silver catheter into the bladder; but the operation was attended with severe suffering, and followed by much bleeding. In a few days the patient paid a second visit; but his surgeon could not pass any instrument whatever, and the suffering produced was so great that the treatment was given up.

On examination, I found that the urethra was in an excessively irritable state, and was contracted about three inches from the meatus. I could just get the point of a No. 1 silver catheter into the stricture. The water came away with the greatest difficulty. The bladder was so irritable, that the patient was compelled to rise repeatedly in the night; and there was incontinence: the urine alkaline, and cloudy with mucus. I did not make any attempt to get an instrument into the bladder, but ordered him to remain

quiet, and to take some pareira brava and hydrochloric acid.

16th.—I have made two or three attempts to get into the bladder by the very cautious use of the smallest silver catheter, which has been passed through the stricture in the spongy portion, which I have ascertained to be about two inches long. But the instrument is arrested by another stricture at the bulb; and the patient is so sensitive to pain, that I took this day a No. 1 catgut bougie, and after some time got it fairly into the bladder.

18th.—A great deal of pain has been produced by this operation; but I was enabled to pass the bougie again with much more ease. It is very evident, however, that I have to deal with a stricture of the worst description.

20th.—I again passed the catgut bougie, and, having kept it in a quarter of an hour, attempted to pass the next size, but vainly: I therefore applied a small piece of caustic potash, on a wax bougie, to the face of the stricture.

22nd.—Very little irritation had been produced by the caustic, and the patient says he has passed water more easily: I therefore applied the caustic on a No. 2 wax bougie, so that its point might penetrate the orifice of the stricture.

25th.—This gentleman suffered considerable irritation for some time after the last application; but this lessened by degrees, and, whilst straining to pass water, something suddenly appeared to give way, and his urine immediately came away in a larger stream than he had seen for five years. I passed a No. 3 wax bougie, armed

with caustic, into the stricture. The urethra was much less irritable.

February 3rd.—I have succeeded, by two further light applications of caustic, in passing a No. 3 wax bougie fairly through the first stricture. Some temporary retention was produced after one of these operations; but this was relieved by the patient himself, who introduced a gum-elastic bougie to the face of the stricture. To-day I found the urethra not irritable, and I was enabled to pass the unarmed wax bougie fairly into the bladder. The patient is very much improved.

10th.—He passes water in a fair stream. I introduced No. 4 wax bougie into the bladder.

14th.—Passed No. 3 silver catheter into the bladder.

March 10th.—This patient, after the introduction of the catheter a few times, was enabled to pass his water very much better. But a great deal of pain and irritation is caused by metallic instruments, so that, in accordance with my views, I laid them aside, and have been using wax bougies: this day I passed No. 5 into his bladder.

Subsequent to this, the patient went to his duty with his regiment in camp, from whence he wrote me a letter expressing his gratitude for the relief which I had given him. I begged of him to take some bougies with him for the purpose of introducing one occasionally, explaining to him that his stricture was of the worst and most contractile disposition.

This case, although of necessity incomplete, is related as an example of the most troublesome form of stricture, seated in the anterior or spongy part of the urethra, and in a very irritable subject. It serves also to illus-

trate my previous remarks regarding the ill effects of the employment of small metal catheters in such a case, the benefit of using the wax bougie, and especially the efficiency of caustic potash as an adjunct in the treatment of certain very bad cases. It will be seen that it was necessary to apply it several times in this case, although the application was made each time in the gentlest manner; so that the patient, with all these applications, did not suffer one tithe of what he did from one single use of the small silver catheter before he came under my care. There are certain cases in which the surgeon cannot possibly use metallic catheters, and this was a fair example of such: disappointment ensues and mischief is produced by persisting in their use, and it is far better to lay them aside and resort to the unirritating bougie, or to a mild application of caustic.

Case III. Case of J. J——, Esq. Stricture impermeable to instruments; removed by potassa fusa.

This gentleman, who was a stout man of irritable temperament, and much addicted to wine and women, applied to me, in November, 1849, with stricture of the urethra. His age was forty, and he had first perceived symptoms of the malady twelve years previously; these had increased very much, and he had undergone treatment on various occasions. During the last year, he found that his symptoms were becoming very severe, and he accordingly applied to a surgeon of eminence then alive, who, after repeated trials, passed a small catheter into the bladder. The patient, finding himself much relieved, went into the country, and returned to his habits of intemperance for a month, when he again came to his surgeon, who now made several trials, but

could not succeed in getting an instrument into the bladder; and on one occasion he hurt the patient very much, and caused considerable bleeding to take place. Just after this, the surgeon died, and Mr. J. was recommended to consult me. At this time he was suffering severely. He had extreme difficulty in making water; it only came away in drops, and occasionally there was complete retention. His bladder was so irritable, that he was compelled to rise several times in the night. His mind was unsettled and irritable, and he resorted to stimulants, which increased his disorder, and he since informed me that he was strongly tempted to destroy himself.

On examination, I found the urethra excessively irritable, and ascertained that there was a tight but irritable stricture five inches and a half distant from the meatus. I endeavoured, with care, to pass an instrument through it, but, after repeated trials, made no way, not even getting into it; and as the patient was becoming very bad, I proposed to try potassa fusa, and he cheerfully assented.

The first application was made, on December 5th, by means of a common wax bougie: the caustic was somewhat freely used. This was followed by considerable pain and some retention of urine, which was overcome by a warm bath I desired him to take. The potassa fusa was applied on three other occasions, and by this time the stream of urine had become very much enlarged, and very great relief was produced: still, I could not, from some reason or other, get a catheter into the bladder. As he had obtained this partial relief, he stayed away from me for nearly three weeks, during

which time he had suffered with an attack of gout, and had been compelled to live very quietly and take medicine.

He came to me again January 16th. I tried to pass a catheter into the bladder, but failed: fortunately, there was hardly any irritability of the urethra. Potassa fusa was applied to the face of the stricture. No disturbance whatever was caused by it this time; it was accordingly used again on the 19th and 22nd. On the 25th, the bougie used (No. 6) went completely through the stricture, and I was enabled immediately to pass a No. 6 catheter into the bladder, to the great joy of the patient. On the 28th, No. 8 was passed, and on the 30th No. 10; and on several occasions I introduced the same instrument with perfect ease. The patient was relieved of his terrible sufferings, and wrote me a letter full of gratitude. I enjoined him to pass a bougie occasionally for himself. In January, 1851, he called on me, and stated that he had no trouble with his water, and should not know from symptoms that he had any remains of stricture. He occasionally passed No. 8 bougie.

In June, 1852, I had a letter from him, in which he stated that he had been able to introduce a No. 8 catheter the night before, although he owned that he was very irregular in passing instruments, and the following are his own words:—"Indeed, the stream of urine has never given me the least trouble since I was under your hands."

This was a very satisfactory case, and shows the power of the caustic potash, for the urethra was completely opened up by it. It was, moreover, by no means a kindly case for cauterization; for the patient

took no care of himself, but indulged in wine and women even whilst he was under treatment, so that the application of the potash was followed by more suffering than is usually seen. The stricture was of some extent, and having existed twelve years, the diseased portion of the canal became very indurated, and the canal was also very irritable. From these reasons, various applications of the potassa fusa were necessary.

It will be observed that when I applied the caustic at the second stage of the treatment, Mr. J—— suffered nothing : this shows that the caustic itself did not produce his previous sufferings, but that the pain and retention were the result of the irritability of the urethra, and of his system generally. This, however, was allayed in consequence of his being attacked with gout, and being obliged to refrain entirely from stimulants ; and this fact shows the importance of the patient living quite abstemiously.

The next is a case which also shows the benefit of potassa fusa ; but it differs from the one just related, inasmuch as only one application was needful to enable me to get through the stricture.

Case IV. J. F——, Esq., aged forty-two, stoutly made, and given to free indulgences, applied April 27th, 1852, with stricture. Suffered first five years ago with symptoms of stricture, consisting of pain in micturition, frequent desire, and latterly diminution of the stream. During the last year, the last symptom had become more decided ; and within the last three months the urine came away in drops, and the act of micturition takes five minutes. After drinking freely, the urine has come

away unconsciously to himself. Various attempts had been made to pass instruments, but on no occasion was his surgeon able to get any into his bladder.

On examination, I found a stricture at eight inches; it was very irritable, and I could not get the bougie within it: the urine was very acid. I ordered him a mixture of liquor potassæ and tinct. hyoscyami, and a warm bath.

April 29th.—I again attempted to pass a small gum-elastic bougie; and it stuck in the stricture, but did not go through it. This gentleman was about to proceed into the country upon some business, and he was desirous of getting some effectual relief before going; and as the attempts hitherto made by his former medical attendant and myself did not succeed, it was determined to use potassa fusa: accordingly, I applied it on a No. 3 wax bougie freely to the stricture, and afterwards ordered him a warm bath.

May 1st.—No retention after the operation, but there was considerable pain when passing water. Mr. F—— was ordered to keep perfectly quiet, and go on taking the mixture of liq. potass. and hyoscyamus.

3rd.—The pain has been and is still very severe; and he has suffered from general febrile disturbance. There is a free muco-purulent discharge from urethra; but he now passes his water more freely than he has done for months. I carefully examined his urethra with a No. 3 wax bougie, and, to our great satisfaction, it went fairly into the bladder.

5th.—Irritation much less; passes water capitally. No. 3 wax bougie, and afterwards No. 6, went into the bladder.

7th.—No. 6 passed with greater ease.

13th.—No. 7 and No. 8 gum-elastic bougie passed.

18th.—No. 9 gum-elastic catheter passed.

20th.—No. 9 again passed. There appears now to be no remains of stricture at the back of the canal; but there is a slight contraction, about two inches from the meatus, which obstructs the catheter: the orifice also is small, and will not readily admit more than a No. 9. I taught this gentleman to pass a bougie for himself, and have advised him to pass a No. 6 or 8 occasionally.

These two cases contrast with each other in more than one point of view. In the former, the stricture was of many years's tanding, and involved a considerable extent of the canal. In the latter, the affection was not of such duration; and I believe it was short in extent. In the one case, several applications of the potash were required; in the other, only one operation was necessary. They both resembled each other in the severity of the symptoms, and especially in the irritability of the parts. In the latter case, however, the irritability of the stricture was most evident; and I suspect the caustic did good chiefly by removing this morbid condition. Had this patient not been going away so soon, it is possible I might have gone on using simple dilatation, and might have succeeded in getting through the stricture after a time; but in the use of remedies, we must often be guided by circumstances.

The next case illustrates the use of potassa fusa in stricture complicated with perineal fistula.

Case V. John Padwick, aged fifty-one, came into King's College Hospital, under Mr. Fergusson, March, 1852. A

year previously he was treated for stricture, having had catheters regularly passed until a No. 8 could be introduced, and he was apparently cured. However, he led a loose life, neglected himself entirely, and the disease returned in a worse form. Abscess formed in the perineum; this was opened, and urine came away through the aperture; other fistulæ were produced, through which most of his urine passed, and he then came into the hospital. On examination, a tough stricture was found to exist at five inches from the orifice; there was very great thickening along the urethra, and there were also several fistulous openings in the perineum. Most of his urine came away by the fistulæ, scarcely any permeating the natural passage. Several attempts were made by Mr. Fergusson to pass a small catheter into the bladder, but he could not introduce the smallest even, and there was so much thickening in the perineum that it was deemed a fit case for external section, and it was proposed; but ultimately it was determined upon to use potassa fusa.

March 11th.—Potassa fusa was applied on a wax bougie pretty freely to the face of the stricture: the pain, not very severe, lasted one hour. In the night a rigor came on.

15th.—Patient has passed more water by the urethra. Potassa fusa was again applied.

18th.—No more rigor after the caustic; complained of some pain in belly; passes water much better.

23rd.—This day, the bougie upon which the caustic had been applied (No. 7) passed fairly into the bladder.

25th.—No. 7 silver catheter was passed. This man

now passes urine with much greater facility, less comes through the fistulous apertures, and the thickening is going down.

30th.—No. 7 gum-elastic catheter was introduced to-day, and ordered to be kept in.

April 8th.—This catheter was kept in for four days. The urine passes from the natural canal in a good stream, but little coming by the fistulæ. No. 9 gum-elastic catheter, and then No. 10, was passed.

From this time, the fistulæ gradually closed, the thickening along the urethra disappeared, and the patient was discharged in very good condition.

In this case is seen the influence of potassa fusa; for it has hitherto been considered that a cutting operation is necessary for curing fistulæ connected with inveterate stricture: and, indeed, I am fully persuaded that the surgeon who treated him would have cut the patient, had he not been urged to try the potassa fusa. Only two free applications were necessary in this case: and this, perhaps, is surprising, when it is remembered that there was great induration all along the urethra; for it will be found that such cases are peculiarly intractable, even by caustic. Nevertheless, it is a most important thing that the surgeon has in his power a remedy which will permit him to dispense with the knife in many of those cases which are supposed to require it.

I detail the particulars of the next case, because it shows the powerful effect of potassa fusa, and also because its use was *followed* by an abscess in the perineum. I say *followed*, because I do not believe that the abscess was caused by the agent. However, it is not my intention to show the bright side alone of any

Case VI.

particular plan of treatment, and I therefore give the history of this case in particular at full length.

Case VI. John Hedges, aged forty-one, by occupation a shoemaker, applied to me at the Westminster General Dispensary, March 2nd, 1852. This man was suffering most intensely from the effects of stricture. He had the most extreme difficulty in passing his water, and excessive irritability of bladder. On examination, I found that there was enormous thickening all along the course of the urethra; and there was, especially behind the scrotum, great induration. There was a great quantity of muco-purulent discharge from the urethra. On passing a bougie of catgut, I found it obstructed by a dense, unyielding stricture, at three inches and a half from the meatus; but I could not get any instrument through it. There was considerable constitutional disturbance, an anxious countenance, furred tongue, quick pulse. He stated that he had had six attacks of gonorrhœa, had never used injections, and had suffered with symptoms of stricture for ten years. He had been under surgical treatment, but no instrument had been passed since two years, when a No. 1 silver catheter was introduced at an hospital to relieve an attack of retention. Latterly he had suffered greatly from irritability of his bladder; and within the week of his coming to me he had had so much pain, that he was compelled to seek assistance.

I armed a bougie with potassa fusa, and applied it to the stricture very freely.

March 4th.—No retention after the application of caustic, nor bleeding; but there is a large amount of muco-purulent discharge, and there is a great deal of

pain in passing water. I again applied the potash, and the bougie went in one inch further.

6th.—The agent is causing great distress. There is constant desire to pass water, weight in the anus and perineum: the swelling in the latter has increased. I passed a No. 3 bougie fairly through the stricture, and carried it nearly eight inches down the canal, where it was arrested. I did not make any further trial to-day, but ordered the man to foment the parts well, to take a full dose of liquor potassæ and hyoscyamus, and to have a suppository of pil. saponis cum opio.

8th.—The suffering has been great. I passed a small bougie through the stricture, and ordered him a warm bath, to get his bowels opened, and to take twenty minims of laudanum every four hours.

11th.—This patient is still suffering much from irritation of the bladder and pain in passing water. There is increased swelling in the perineum and scrotum. The tongue is much furred; countenance anxious; pulse quick. I was enabled to pass a No. 4 wax bougie into the bladder. As the symptoms appeared to me to indicate the existence of matter, I sent him to bed, and made an incision through the indurated tissues, carrying the point of the knife very deeply, when matter was evacuated in some quantity. He was ordered to continue his opium, and to poultice the perineum.

12th.—Very much relieved. Spent the whole night without once being obliged to get up to pass water. He urinates much better, and with much less pain; and there is much less constitutional disturbance. Matter keeps on discharging from the wound; but no urine comes away from it, apparently.

18th.—Much better; hardly any irritability of bladder. I passed a No. 4 bougie easily into that viscus.

23rd.—Very little suffering now. No. 6 bougie passed.

29th.—Passed a No. 6 silver catheter.

April 5th.—Passed a No. 6 wax bougie with ease. The opening in the perineum is not disposed to heal, and urine now comes away by it when the patient empties his bladder.

12th.—No. 8 bougie passed. A great deal of urine comes away by the perineum, and the surrounding induration does not diminish. I have determined to draw his water off every morning and night, and not permit him to pass it himself, so that the fistula may have the opportunity of healing. This I did for several days, and it had the effect of diminishing his suffering very much; but the opening did not seem disposed to heal, and as he was in very bad circumstances, and was compelled to keep the sitting posture to attend to his work, I thought it better that he should have the comforts of an hospital, and accordingly sent him into King's College, under Mr. Fergusson. By this time there was not any appearance of stricture remaining, and I could pass a large catheter with ease. At this institution it was thought necessary to make a freer incision through the diseased textures, and at the same time to open the canal. A great deal of bleeding—causing the patient to faint away—followed this operation, but he rallied. The opening gradually closed, the induration disappeared, and I saw the patient, some time afterwards, looking quite hearty.

* * * * *

Now, upon this case I look with special interest, as

affecting the question as to the mischief which may be produced by potassa fusa. An observer who is prejudiced would at once exclaim, "Here is the very case to show it:" but it appears to me that we should not hastily conclude that the suppuration was produced by the caustic, nor, on the other hand, should any one as hastily say that the agent was harmless. The fact is certain that perineal abscess did exist; and it is equally certain that the most decided symptoms of this mischief only appeared after the potash had been freely applied on two separate occasions. Nevertheless, there were some symptoms which strongly indicated the approach, if not the existence, of suppuration when Hedges first came to me. These were excessive irritation and great difficulty in passing water, amounting almost to retention. Moreover, there was great swelling in the perineum, and at the same time an extensive *muco-purulent* discharge from the urethra. From all these, I am inclined to think that matter had already formed very deeply: and not only this, but I strongly suspect that there was a communication between the abscess and the urethra. Although the potassa fusa acted powerfully in destroying the long and tough stricture, I believe that it may have done harm by increasing irritation: at all events, it was followed by great suffering, and it appears now that the best course would have been to have at once laid the perineum and the urethra freely open by the knife. This case, at any rate, will, I hope, prove an instructive one, as it shows how extremely cautious we should be in using potassa fusa.*

* With my present experience of the effects of potassa fusa, I certainly should not use this agent now in such an instance.

It has been observed, in a preceding portion of this chapter, that the potassa fusa is not only serviceable in cases of impermeable stricture, but that it may also be applied with advantage in certain cases where a small instrument can be introduced, but where, either from an excess of irritability, or from the surrounding induration of the spongy portion of the canal, the dilating process cannot be carried on. In such cases I have applied the potash with benefit, although I must with truth say that it has not acted so well in such, as where there has appeared to be perfect impermeability of the urethra.

Question of permanent benefit.

I shall not relate any more cases of the treatment of stricture by potassa fusa, as there are other important points in connexion with treatment to be considered. I have shown that a stricture may be opened up or destroyed, for a time at least, by the use of this caustic; but I must say a word or two as to the *permanency of the benefit.*

I am aware that some suppose that there will be no return of the disease after it has once been removed by potassa fusa. My own experience tells me that, even after a stricture has been well opened up by it, there is just as great a chance of the stricture returning again as after any other kind of treatment, if the precaution is not taken to pass a bougie every now and then. The hardened tissue may be destroyed, but still there is the tendency for the contraction to reappear. In more than one instance I have seen re-contraction take place to a considerable extent, but the most striking instance is as follows:—

Case VII.

W. W——, the steward of an Indiaman, applied to me in May, 1850. At that time he had a very undilat-

able stricture at the spongy portion of the urethra, about two inches from the orifice. I was obliged to use potassa fusa, as the patient was compelled to join his ship in a month. Rapid amelioration ensued, and I was enabled to pass a No. 8 catheter in that time. He then sailed for Calcutta, taking with him a stock of wax bougies to pass occasionally. When he got into the warm climate, his bougies melted, and he could not get any more. In May, 1851, he again applied to me, with his stricture in as bad and undilatable a state as when he first came under my care: I could only with difficulty pass a No. 2 bougie.

I need not relate any more instances, because *one alone* suffices to prove that re-contraction will take place if dilating instruments are not occasionally used.

Conclusions from foregoing cases.

The cases above related prove that Mr. Syme's assertion, before quoted, is unfounded, and that a real organic stricture may be destroyed by potassa fusa as well as by other means, or removed for a time at least, and that, too, much more quickly than by ordinary dilatation. I do not, however, consider that the surgeon possesses any means of *curing* an organic stricture absolutely and entirely; because, if such were the case, we should not find the disease return, as it certainly does if not attended to. But in dilatation we have the means of getting rid of stricture for a time; and if the patient is careful enough to continue the use of bougies occasionally during his lifetime, there is reason to believe that he will not suffer again. And in the *potassa fusa* the surgeon has the means of assisting dilatation when it is inefficient; and it appears to me that we should consider it chiefly in the light of an adjunct to dilatation, so as not to be led to trust to it alone, or to be led into using it too fre-

quently. Caustics should be considered to hold the same relation to the treatment of stricture as the same remedy has to the treatment of some forms of ulcers: it is merely an auxiliary. In a callous ulcer of the leg which has been in existence for years, the surgeon puts his faith chiefly in compression as a means of cure; but, at the same time, if he finds that there is either no action about the sore, or if there is an undue and morbid irritability of its surface, he finds that, by a touch or two of some powerful caustic—as potassa fusa or nitrate of silver—he materially expedites the cure, and, indeed, brings it about in some instances where the strap and bandage alone would not effect it. So, in the treatment of stricture, the majority of cases may be remedied by dilatation (it is the chief means); but cases will be found which will not yield to it, and then is it that the surgeon is justified in resorting to caustic as an auxiliary.

Above all things, it is necessary to bear in mind that caustic, and especially potassa fusa, is not to be used without *extreme caution*, either, indeed, as regards its actual application, or the selection of the cases for its employment.

CHAPTER VIII.

TREATMENT OF STRICTURE BY INTERNAL SECTION.

Preliminary remarks.

I HAVE now arrived at a most important part of my subject—viz., the treatment of stricture by *division with the knife*. It is surrounded on all sides with difficulties, which can only be appreciated by those who have paid any particular attention to a matter concerning which there has been of late years so much angry contention. In order to arrive at any degree of certainty regarding the treatment of stricture by *incision*, the inquirer must set about his work with a mind totally unprejudiced. He should carefully examine the facts and statements which have been laid before the profession; but, above all, is it necessary to note with care and accuracy the facts which have been under his own observation: for if he has not had some extended experience of this method of treating stricture, it will be hopeless for him to try to come to any correct conclusion himself, or to enlighten others. As it has fallen to my lot to see much of this treatment, the observations here addressed will be found to depend entirely upon what has been presented to my own notice; although I have studied the opinions of others, and shall not be wanting in availing myself of them.

Incision of strictures.

It will be well to enumerate briefly the various methods of incising stricture, as also the kind of cases to which incision is applicable, before entering *seriatim* into each particular process.

Various methods of each.

In the first place, then, we may divide *urethrotomy*, as this is called, into two chief varieties—*internal* and *external section.*

Of internal.

Of each of these methods there are two varieties. In the former the operation is performed in two distinct ways: 1st, cutting the stricture from before backwards; 2ndly, cutting it from behind forwards.

Of external.

The external section is divided into two varieties—viz., that in which the stricture, being *impassable* to instruments, is cut at the point of a sound passed down to the obstruction; and that where the stricture, being *permeable* by instruments, is divided upon a grooved sound, previously passed by the surgeon into the bladder. In this chapter I shall speak of *internal section.*

Internal section considered.

The cases in which it is found necessary or expedient are short, hard, unyielding strictures, situated in the straight portion of the canal, which do not admit an instrument; 2ndly, the same kind of stricture, which, although admitting a small instrument to pass, proves rebellious to dilatation; 3rdly, strictures situated at, or just within, the orifice of the urethra.

Cases to which it is applicable.

To no form of stricture is internal section so well adapted as that last spoken of: in fact, it is absolutely necessary to begin the treatment by dividing the stricture.

Strictures at the orifice of urethra.

I have in a former chapter spoken of this form of stricture, and have stated that there are two varieties—that in which it has arisen from ordinary causes, and that which has been caused by ulceration of the lips. To both these, internal incision is necessary; and

Civiale.

to this effect I quote the words of Civiale:—"At all

times, when the orifice of the urethra is too narrow to allow the instruments we wish to introduce into the deep parts of the canal to pass freely, or to permit of the passage of fragments of calculi which come from the bladder; at all times, also, where it is a question of destroying an organic stricture, of which this part is the seat,—we ought to have recourse to debridement, to incision, which should comprise all the tissues which constitute the morbid state."

Why necessary in such.

From the great density of the structure of the glans penis—probably also from the circumstance of the organic muscular fibres meeting at and encircling the meatus, and from the natural narrowness of the orifice,—a stricture seated here is most unyielding, and dilatation can effect but little or no good: the stricture must first be divided. It is true that a kind of valve or membranous stricture is met with in this situation, which may be broken down by a metal catheter or sound; but I have not yet met with such a case in the living subject: on the contrary, all those I have seen were dense and firm obstructions which did not admit of any other treatment but that with the knife. So contracted is the meatus in the majority of cases, that it is only just possible to introduce a probe; and in some cases the contraction is so tight, that a probe even cannot be passed; and a fistulous opening may exist at the under surface of the glans: if this does not obtain, complete stoppage of the urine may occur. Of each of these conditions from stricture at the orifice I shall detail a case.

In some of those cases where there exists a stricture just at or within the meatus, independent of ulceration

of the glans, one or more contractions will be found further back; and thus it is that a stricture at the orifice renders the treatment of the one behind so very difficult: consequently, with the view of rendering instruments more manageable in our hands, it will be imperatively necessary to divide the obstruction at the orifice. The following is an illustration of such a case, and of such treatment.

Case I. Mr. C——, aged thirty, married, formerly a naval officer, applied to me December 18th, 1848, with severe signs of stricture. On examination, I found the orifice of the urethra so narrowed, that I could with difficulty only pass a probe. As I knew that it would be useless to attempt dilating such a stricture, I told him to come in three days and have it cut.

Dec. 21st.—I passed a probe through the contraction; then conducted a narrow, sharp-pointed knife along it, and divided the stricture. I then passed a No. 4 wax bougie down the canal, but found it arrested at the bulb: but, by careful pressure, it overcame this second obstruction. A small portion of lint was introduced into the meatus.

27th.—I have been passing a bougie every day through the divided stricture. I have not used one larger than No. 4; but this passes readily, and a smaller one goes into the bladder. This day, after I had passed the bougie through the meatus only, the patient on going home got retention. He came back to me, and I passed a small wax *bougie* quite into the bladder, and allowed it to remain for half a minute, then withdrew it: the patient immediately passed water.

January 1st.—No. 5 wax bougie passed.

3rd.—No. 5 passed again: it was tightly grasped.

5th.—The meatus is very irritable: I therefore applied nitrate of silver to it.

6th.—Irritability much less. I introduced No. 6 silver catheter as far as the second stricture, where it was arrested for a time; but, by gentle pressure, it went right into the bladder.

9th.—Passed No. 6 with ease.

13th.—On using the instrument, I found it produced excessive spasm; and on questioning the patient, I found he had drunk two bottles of sherry on the previous evening.

17th.—Passed No. 8 bougie.

22nd.—No. 8 enters readily.

31st.—I am now able to pass No. 10 silver catheter with ease. I dismissed him, therefore, urging him to have an instrument passed now and then.

June, 1849, I saw this patient. I found I could pass a large bougie into his bladder; but there is some resistance in the orifice, from a partial re-contraction of the part divided.

I have detailed this case somewhat at length, as it illustrates more than one point relative to the pathology and treatment of stricture. In the first place, it is a good instance of the condition of stricture met with at the meatus, rendering it so narrow that a probe only is passed. Division, in this case, was necessary, not only to permit the further dilatation of the meatus, but also to allow me to introduce instruments for the purpose of opening up the back part of the canal. It has been seen that, for dividing the orifice, I only used a sharp-pointed bistoury, and divided it just enough to allow of

the introduction of a No. 4 bougie. By this means, dilatation could be carried on with effect. I did not make the incisions so freely as I ought to have made them. It would have been better had the meatus been incised so that a full-sized bougie might have been introduced at once. This would have saved a deal of time and trouble.

There are also one or two points which this case illustrates in addition. It will be seen that, on one occasion, retention occurred after a bougie had merely been passed through the first stricture. This circumstance shows how very readily irritation is propagated from the extremity of the urethra to the canal near the bladder, and that retention of urine may be relieved by the mere contact of a bougie with the stricture. The case also shows how hurtful stimulants are to a patient whilst under treatment for stricture, and how difficult this treatment is rendered by a debauch, in consequence of the excessive irritability which is produced.

In some instances, retention of urine will occur in consequence of a narrow stricture at or within the orifice of the urethra. If called to such a case, it will be better for the surgeon to divide the stricture at once with the knife: by this means the patient will be saved a great deal of trouble and suffering. The following case is to the purpose:—

Case II. Mr. C——, an elderly person, applied to me May 28th, 1850. He had been suffering from nearly complete retention of urine for two days; he was only able to pass his water in drops, when he strained violently, and was in great distress. On examination, I discovered that there was a tight contraction just within the orifice

of the urethra, through which I could only pass a small probe. I introduced a No. 1 silver catheter through the stricture, and carried it down to near the bulb, when it was obstructed so that I could not get it any further, or manœuvre it so as to pass it into the bladder. I therefore requested a friend to see the case, who, with some care, passed a No. 2 silver catheter into the bladder, and relieved the patient. Afterwards the stricture of the meatus was divided, and then a No. 6 catheter could be passed with ease; this fact proving that there was no contraction behind, and that the retention of urine was dependent upon the first stricture.

The preceding case is interesting, as it shows that when a firm and narrow stricture is seated in the anterior part of the canal, the instrument used becomes so tightly grasped that it cannot be moved about with freedom; consequently it becomes arrested at some particular point, generally at the bend of the canal, and the surgeon may thereby be led to suppose that a second stricture exists. I have on several occasions been deceived on this point, and the mystery will not be cleared up until the orifice of the urethra is divided so as to admit an instrument of moderate size.

Many of the cases of stricture at the orifice of the urethra are produced by ulceration of the glans penis, implicating the lips of the urethra: the contraction is produced by the subsequent cicatrization. In such cases the cause will be recognised by the appearance of the part. Probably, there will be a loss of surface of the glans to a considerable extent; or, if this is not present, a well-marked cicatrix will be seen in the

situation of the meatus, which itself can hardly be discovered. Free division is absolutely necessary here. The following is a case of this nature, and it illustrates the severity of symptoms which are produced by neglected stricture.

Case III. Thomas Cox, aged forty-five, married, formerly a sailor, and of drunken habits, applied to me January, 1852. His countenance was sallow and anxious. His chief complaint was of a severe pain in his loins; indeed, my attention was only called to this one symptom, until the patient called a second time, when, finding that the remedies had not relieved him, I asked more minutely about the urinary function. He then told me that he was constantly called to make water, that it passed freely along the urethra until it came to the extremity of the canal, when it suddenly stopped. On examination, I could hardly see the orifice of the urethra; but in its place was a depressed cicatrix, and, after some trouble, I succeeded in getting a small probe through its centre into the urethra, when a large quantity of pus was discharged. He now told me that there was a large quantity of this matter deposited at the bottom of his chamber-pot, and that he noticed it come away with his water. The urine was most highly offensive, and strongly alkaline: under the microscope, large quantites of pus globules and phosphates were noticed. He stated, that seven years ago he had gonorrhœa, and, at the same time, there were some ulcerations on the glans penis. After these healed, he fancied the stream of urine decreased in size; and then difficulty in passing it came on. Seven months prior to his visiting me, retention came on: since this period his sufferings have

been aggravated much. With some difficulty, I got a No. 1 catheter into the bladder, and drew off a large quantity of urine mixed with pus. I ordered him to take ten minims of nitro-muriatic acid, and to come in a day or two to have the orifice of the urethra divided.

28th.—I passed a probe through the contracted part, and with a sharp-pointed bistoury cut upon it, and so freely divided it that I was enabled to pass a No. 10 silver catheter into the bladder. A large quantity of highly purulent urine was drawn off. To continue the acid.

As this patient still complained of so much pain in the loins, and as the urine contained so much matter, I thought that there might be some disease in the kidney, and therefore had the opinion of Dr. George Johnson, who considered that the pus came from the bladder, and was the effect of the long-continued stricture, and advised me to empty that viscus every morning with the catheter.

I did this for several days, and it had the effect of diminishing the quantity of pus in the urine. He could, moreover, pass it in a good stream, as the orifice continued patent. But he was a careless man, and as soon as he began to improve I lost sight of him.

I cannot insist too much upon the necessity of making a very free division of the meatus when contracted from the cicatrization of a chancre: for if this be not done, it will be necessary to resort to a second incision in a few days, perhaps. The following is a most severe instance of this form of stricture, illustrating this point.

Case IV.

Captain S——, ætat. thirty-six, sent for me early on the morning of May 11th, 1854. On arriving at his residence, I found him suffering dreadfully from retention of urine, which had come on eighteen hours previously. On attempting to relieve him, I found that nearly half the glans penis was gone, and that the site of it was a cicatrix, in the centre of which the small contracted orifice of the urethra was visible. I managed to introduce a No. 4 silver catheter into the bladder, and drew off a large quantity of urine and mucus. He told me that he had contracted a horrible chancre whilst on the route with his regiment some years ago, and whilst he could not attend to himself: the result was, that when the sore did ultimately heal, he was left in this mutilated condition, and he gradually found symptoms of stricture, which became very distressing; and so fearful was he of surgical interference, that although he had carried a letter of introduction to me about with him for six months, and was suffering more and more, he did not seek for relief until compelled by retention of urine coming on.

On the 15th, I incised the meatus, so as to permit me to introduce a No. 9 catheter. After this the water came away freely.

On the 23rd, I found I could only pass No. 8.

On June 1st, the orifice was evidently contracting; so I divided it again very freely, and introduced a No. 10 silver catheter into the bladder.

The orifice of the urethra was remarkably dense and retractile, and it was very evident that repeated dilatation would be necessary. As, therefore, this officer was going abroad on his public duties for some years, I

advised him to get a No. 9 and 10 silver catheter, and pass one frequently for himself.

He called upon me in August before his departure, and assured me that he had no trouble with his urethra, and was enabled to pass his catheter with the greatest ease.

The contracted orifice may be divided by an ordinary sharp-pointed narrow bistoury, when it is possible only to introduce a small probe. If however, it is possible to pass into the urethra as large an instrument as a No. 4 catheter, the urethrotome, which I shall speak of further on, is better adapted. It is most important to dilate the orifice every day with a metal sound for at least a fortnight after the operation. If this be not done, the contraction will return.

A stricture at the orifice of the urethra is sometimes complicated by the presence of a calculus behind it. If one has escaped from the bladder, and if at the same time there exists a tight contraction of the meatus, it cannot get out of the urethra, and becomes stopped in the fossa navicularis : if it is allowed to remain there, a great deal of irritation is produced, the stone grows larger, and may increase to an incredible size. The following is an instance of this extraordinary state of things. I was requested to see the patient some years afterwards by a friend under whose care the case originally was placed. I cannot do better than give the surgeon's account of it :—

" James Guy, a labourer, aged thirty six, of delicate habit, applied to me in November, 1839, with a calculus in the urethra, and stated, that he had found it there and gradually increasing in size for ten years, and Case V.

during that time (though a servant to a medical man) had never stated his complaint, when now, through extreme suffering, he was driven to do so; at which time I found a large calculus lodged in the urethra immediately behind the glans penis, where it had made a false opening, through which the urine had so long issued that the urethra anterior to it was completely closed, so much so that the smallest bougie could not be passed. The presence of this foreign body had much injured the patient's health, as he was much emaciated, and evidently suffering much from the constant anxiety his state must have thrown him into. In order to remove the stone, I had merely to enlarge the opening by an incision with a common scalpel, when it escaped; and he has since suffered no further inconvenience, with the exception of the urine continuing to pass through the false opening, which it always has done, thereby baffling my endeavours to get such a perfect union of the parts, by which, and by the passing through from the natural orifice of bougies or flexible catheters, I might get the urine to pass off naturally. Up to this time the patient has continued, though delicate, in tolerably good health, and no calculi have hitherto even appeared to be re-forming."

This was dated in March, 1843. In the early part of 1851 I saw this patient. At that time a large irregular opening existed on the lower surface of the glans penis, through which nearly all the urine escaped, only a very small quantity coming away through the meatus, which, as above stated, was much contracted. I may mention that the calculus weighed upwards of *five* drachms, and was composed of phosphates.

In this case, in all probability, the contraction of the orifice of the urethra had existed prior to the formation of the calculus, which had escaped, when much smaller, from the bladder, and had travelled along the urethra until stopped by the stricture: it remained in the fossa navicularis, increased greatly in size, the urethra ulcerated, and thus a vicarious opening was allowed for the urine.

If a calculus is met with obstructed by a narrow contraction of the meatus, and there is no false opening, as in this case, the proper mode of treatment will be to incise the stricture very freely, so as to allow of the introduction of a scoop or a pair of urethral forceps, by which the calculus may be extracted.

After division of a stricture at or within the meatus, it will be necessary to pass a full-sized bougie frequently and for a long period, because there is more tendency for re-contraction to take place here than in any other part of the canal, as naturally it is about the most narrow portion of the urethra.

Internal incision in stricture in deeper portions of the urethra.

Internal incision is practised not only in cases of inveterate stricture at the meatus, but is also considered useful, for remedying stricture situated in the deeper portions of the canal. At one time indeed, in this country, the attention of surgeons was greatly directed to this method of treating stricture, in consequence of Mr. Stafford's strong advocacy of it. This, like many other special modes of treatment, has of late years been less thought of and practised among English surgeons, and much obloquy has been thrown upon the procedure. Some of this opposition, doubtless, was deserved. Mischief has ensued after this, as after every

other method of treatment; but experience has proved that good may be effected, and that there are certain instances of stricture in which internal section may be beneficially adopted. The French surgeons, amongst whom M. Civiale and M. Leroy may be mentioned, are in the habit of practising this method to a considerable extent, and by their ingenuity have brought their instruments almost to perfection. In a work of this nature, it would be most improper to omit an inquiry into a plan of treatment which is now adopted by some, and is thought by others to be the perfection of urethral surgery.

Civiale. Leroy.

As has been before stated, there are two plans of dividing a stricture from the inside of the urethra. The one method obtains only in cases where the stricture is impassable to an instrument, and consists in the division or perforation of the obstruction *from before backwards.* In the other plan, the surgeon passes his instrument first through the stricture, and divides the contraction, as he withdraws the cutting blade, *from behind forwards.*

Two methods.

Cutting from before backwards.

For the purpose of adopting the first method, which is pursued when the stricture is impassable, various kinds of instruments have been recommended. They are nearly all modifications of the same apparatus, which essentially consists of a metal canula, containing within it a blade, which may be thrust out at its point when it is pressed up against the stricture, as in those of Mr. Stafford and M. Civiale. Another instrument, and that which I have seen chiefly used by Mr. Fergusson, consists of a metal director, about six inches in length, furnished with a wooden handle. On the upper surface of the director is a deep groove: into this a long, narrow

Instruments used.

Stafford. Civiale.

knife, cutting only at its end, is placed so that when the director is introduced into the urethra against the stricture, there is no fear of the knife cutting any part of the sound canal in its passage, as its point alone comes in contact with the obstruction. By means of this instrument, very free incisions may be made in the stricture. This instrument is very similar to one used by M. Ricord.

Cutting from behind forwards.

For cutting a stricture from behind forwards, a different kind of instrument is used, consisting of a canula containing one or more blades; but the mechanism is such, that the cutting edge of the blade is projected at the time the instrument is being withdrawn: for, as was before stated, the section from behind forwards first assumes the *permeability* of the stricture, and necessitates the passage of the instrument with which the operation is to be performed. Many ingenious instruments for this purpose have been adopted by the French surgeons, more especially by Civiale and Leroy, in whose works depictions of them are to be found. The latter surgeons are warm advocates of internal division of strictures.

Cases in which it is necessary.

The cases of stricture in which internal incision has been deemed necessary are, of course, those which resist ordinary dilatation by bougies and catheters; for I must here repeat the maxim, that there should not be recourse to cutting if milder means will succeed. In this category are placed those strictures at the meatus of which notice has already been made. Next are those cases of hard and callous stricture, of short extent, which are seated at any distance between the glans and the bulb in the spongy portion of the canal—cases of well-known obstinacy.

Guthrie.

Mr. Guthrie, in his lately-published Lectures, says, in reference to these very cases—"Thus, for example, a stricture two inches from the orifice will be the most obstinate and most difficult of cure in which the corpus spongiosum is found to be hard and unyielding to the touch." In such a case, a most speedy remedy is free division with cutting. The stricture seated here, or lower down in the spongy portion, is always, or nearly always, passable; so that it may be divided from behind forwards, or the section may be effected readily by using the instrument composed of the director and cutting blade.

Not advisable in stricture behind the bulb.

When the stricture is situated midway between the meatus and the bend of the canal, internal section may be performed with ease and safety; but when seated at the curve of the urethra, the facility for dividing it is not so great, and the operation is not without danger. Yet there are some cases of this kind which the surgeon may think proper to divide, and the operation can be effected by using an instrument with a proper curve: a straight instrument cannot be well used for stricture seated behind the bulb of the urethra.

Next to those cases where the stricture is situated at the meatus, the benefit of internal section is perhaps most observable where an obstruction has been opened up by dilatation or caustic to a pretty free extent, and yet a certain portion of the original disease remains, forming, as it were, a salient point in the urethra, which does not readily admit an instrument to pass. This ridge may remain after the treatment by dilatation, by caustic, or by external section: it is more discernible in the spongy portion than elsewhere, because, in fact, as has been

before stated, stricture is more obstinate to dilate in this situation.

Ill results of this practice.

It is almost universally acknowledged that when stricture is seated anywhere in the straight portion of the urethra, internal incision may be performed with safety; but, that when it is met with beyond the bulb, internal section may be followed by very serious results, such as *hemorrhage*, *inflammation* and *abscess*, *infiltration of urine*, *false passage*, and *death*.

Hemorrhage.

When we bear in mind that a very free, and in some instances almost uncontrollable bleeding takes place after a catheter has been carried along the urethra with more than proper force, it is by no means difficult to understand that the use of a cutting instrument may be attended with the same or a greater amount of hemorrhage. Such, indeed, is the case; and those surgeons who advocate the employment of internal section admit that hemorrhage is one of the bad consequences of the practice. It is particularly liable to occur when the stricture is seated at the bulb of the urethra: it is well known how extremely vascular this part of the canal is, and that by a free division of a stricture there, a large quantity of blood may be poured out. It is not to be denied that extensive bleeding has occurred after strictures have been divided in this region. In one instance, a friend of mine attended a gentleman who had a stricture in the perineal portion of the urethra: internal incision was resorted to by a surgeon of the first eminence, and such was the hemorrhage afterwards, that it was many hours ere the patient could be left with safety. The following case, illustrative of this danger, was under my observation.

Case VI. W. S——, Esq., aged fifty, applied to me, in September, 1850, with very bad stricture, which had existed for many years, and from the effects of which he was then in the most reduced state of health. Attempts had been made by the first surgeons to pass instruments, but in vain—the stricture remained impassable. On one occasion, a surgeon made a most determined effort to get a silver catheter into the bladder, and put the patient to exquisite torture, and produced severe bleeding. His symptoms became worse; a fistulous opening appeared at the junction of the penis with the pubes, and all his urine dribbled through this opening. The bladder became exceedingly irritable; and in this condition I saw him, but I could not pass an instrument more than four inches. A few days after my seeing him, this gentleman had an attack of hematemesis, and after this subsided, symptoms of dropsy came on, and he was seen by another surgeon, I remaining in attendance. It was deemed advisable to get a passage into the bladder if possible, as the symptoms were aggravated in consequence of the retention of the urinary secretion and the miserable irritability of bladder he suffered from. The urethrotome, consisting of the director and knife, was passed down to the stricture, and was freely used: by this means a catheter was carried further along the canal, but could not be passed into the bladder. During this operation a considerable quantity of blood escaped, which I noticed to be of an arterial character. The patient was not relieved by this proceeding, but became worse. He had a recurrence of bleeding from the stomach, and sank in a few days after the operation. On examination of the parts after death,

a very dense stricture was found involving the entire extent of the bulb; but below this was an extensive false passage, running along the substance itself of the tissue of the bulb.

Now, it is not my intention to assert that the death of this patient was caused by the internal division of the urethra, for there was another condition tending to destroy life; but the bleeding from the urethra was very great during the operation, and the torture this poor gentleman suffered while undergoing the process was very great, and I am inclined to think that the death was hastened by the operation. It has been seen that a false passage had been made: in all probability, this had been done on the occasion of his former surgeon having tried to force a passage into the bladder.

Pain.

Pain and suffering must necessarily be the result of dividing a stricture internally. How severe sometimes is the pain endured by a patient after only a *blunt* catheter has been roughly, or even carefully, passed! Of necessity, a greater amount of pain must be experienced when the urine comes in contact with the part of the canal which has only been recently operated upon with a cutting instrument. Thus it is I have repeatedly seen men suffer excessively after the operation, and look with dread upon its repetition.

Perineal abscess.

Both *abscess in the perineum* and *infiltration of urine* may occur as the result of internal section of a stricture. Civiale, who is honest in speaking of the accidents which may occur after his favourite method, relates *three* cases of infiltration of urine occurring after it; but they all recovered. Both circumscribed and diffused suppuration is sometimes the result of a free

operation upon a stricture situated in the perineal portion of the urethra. It has not been my lot, however, to see either of these accidents after the operation.

False passage.

False passage may without difficulty be made in using a cutting instrument inside the urethra, more particularly when the operation is done from before backwards, and the obstruction to be dealt with is situated at the curve of the urethra; for, to a certain extent, the incisions must be made at random, and without a certain guide. The same mischance is, however, not so likely to happen in the operation *from behind forwards.*

Death.

That *death* has followed as the direct result of this proceeding, experience has distinctly shown; and M. Civiale relates two instances where, after internal incision, a fatal issue took place.

In the one, a man aged fifty-eight, a violent shivering fit followed the operation; violent reaction ensued, and the patient died suddenly during this reactionary fit, as though he was suffocated.

In the second instance, the patient died suddenly in about fifteen hours after a stricture at the bend of the urethra had been divided.

In neither of these cases was there any bleeding of consequence, nor, in fact, any appreciable cause for death; but the cases are important to show that interfering violently with the urethra, as in making internal incisions, so powerfully affects the general system as to produce very speedy dissolution.

Question of permanency of benefit.

But a most important point, after all, to inquire into, is as to the permanency of the benefit produced by internal section. Does, in fact, this operation produce a

cure, or is there the same tendency in the urethra to re-contract after it as after other treatment? I fear that the evidence which has already been produced by some writers on stricture is sufficient to prove that the remedy is not an efficient one as regards its permanence, and that re-contraction will take place afterwards, even though the stricture be thoroughly incised; and, indeed, there is reason to believe that a more speedy return of the disease takes place than after dilatation. After incision, cicatrization must necessarily ensue, and cicatrization causes encroachment upon the calibre of the canal. This almost certainly takes place if bougies are not from time to time employed afterwards. We *see* that it occurs at the meatus after incision, and therefore conclude that it does take place further back. However, a very striking instance is now under my observation at the time I am writing, which shows how completely internal incision fails to produce a permanent cure.

Case. A middle-aged man was lately under treatment with a stricture of the very worst description, complicated with fistula. He was constantly rising in the night to empty his bladder, and there was a discharge of pus from the urethra. Attempts had been made to get a catheter into the bladder, but uselessly. Some time previously, this same man was under my observation with the same complaint. Internal section of the stricture was practised, and a catheter of good size was passed, and the patient was much relieved. He however neglected to use any bougie; the symptoms returned as before, until he got into the condition described.

Nevertheless, if there were no other weighty objections against the frequent use of the "urethrotome," the

return of the disease after its employment would not be sufficient to induce its rejection; for I have shown that contraction of the canal will take place at the point of original disease after treatment by dilatation or by caustic, and I shall presently give ample proof of the fact that the same thing takes place even after a free external division of the canal, when the precaution is not taken to pass a bougie.

Before leaving this part of the subject to consider the much more complicated and interesting question of *external section*, I shall relate a case of a very difficult nature, in which the treatment was as complicated as the affection itself. It will be seen that, to ensure success, a variety of methods were found necessary; and amongst those employed was, at one stage of the proceedings, *internal incision*. I select this case more particularly, as it illustrates several points in connexion both with the pathology and treatment of the more inveterate kind of stricture.

Case VII. Robert Atkinson, ætat. twenty-five, applied to Mr. Fergusson, at King's College Hospital, in March, 1850, with very bad stricture of the urethra complicated with urinary fistulæ, and being in a truly miserable condition. Almost the whole of his urine passed away by two different openings—one being situated in the centre of the perineum, the other just internal to the spinous process of the ilium on the left side of the belly. From this latter aperture the urine pumped up, as it were from a fountain, when he made attempts to micturate, a few drops only coming away by the natural passage. On making the attempt to pass an instrument along the urethra, it was arrested about three inches from the

meatus. A probe could be passed along the fistulous tract in the abdominal wall for three inches towards the pelvis. There was a great deal of induration along the course of the urethra in the perineum—great irritability of the bladder, the poor fellow being compelled to rise every hour or so in the night to relieve his bladder. He was extremely thin, his countenance sallow and anxious, his appetite gone, and his pulse quick and weak. Seldom have I seen a patient in a more miserable condition from stricture. The following is his history:—

Two years ago, he fell from the mast of a ship across a yard on his perineum. He felt great pain there, but this ceased in a few hours. Swelling then ensued; but this went down, and he continued well until the expiration of a month, when he one day suddenly got retention of urine, and at the end of ninety-eight hours his bladder was punctured above the pubes. A canula was kept in the bladder for six months, and during this whole time he only passed a few drops by the urethra. He states that, soon after the operation, leeches were put upon the belly, and that from two of the bites —one on each side—an opening resulted, and that from each of these the urine flowed when he attempted to micturate. In the course of twelve months, however, that on the right side closed, and at present the cicatrix is visible; but the one on the left side did not close. At the same time that the bladder was punctured, an incision was made into the perineum; but the patient states that matter only was let out, and that urine did not come away from it for six months.

April 20th.—Attempts have been made to get an instrument through the stricture, but vainly. To-day an

incision was made in the centre of the perineum. The urethra was opened, and a flexible catheter was introduced through this aperture into the bladder. As the surgeon was doing this, he felt some foreign substance just in front of the neck of the bladder; and on removing it, it was found to be a calculus about the size of a cherry. As a free opening had been made for the urine to pass away, the patient was put to bed.

He went on very well for a week, when he was suddenly attacked with jaundice, pain and enlargement in the region of the liver. At one time it appeared as though he would die, but he recovered by suitable treatment.

May 4th.—My notes state that he looks better, that the jaundice has gone off, and that the urine passes freely away by the wound. He takes plenty of nourishment.

10th.—An attempt was this day made to pass a small catheter through the stricture, but in vain: potassa fusa was applied to its face.

15th.—Potassa fusa has been applied twice since last report.

25th.—The patient has got much stronger. A gum-elastic catheter has from time to time been passed from the perineal opening into the bladder; but the catheter has not been yet passed down the urethra through the stricture.

31st.—As the catheter could not be passed through the stricture, the urethrotome was used, and the stricture was divided freely, and afterwards a No. 2 silver catheter was passed into the bladder.

June 1st.—No. 4 silver catheter was passed. The

patient is much stronger, and there is much less irritability of the bladder.

5th.—No. 6 catheter passed.

13th.—The patient is now able to walk out in the yard of the hospital. The wound in the perineum is slowly closing up.

27th.—The wound in the left iliac region is now entirely closed up. No. 5 catheter passed.

July 5th.—There has been some little difficulty in passing the catheter through the stricture; the urethrotome was therefore again used, and afterwards a No. 8 catheter introduced, and ordered to be kept in. From this date the patient went on well. A No. 10 catheter was introduced into the bladder; the water passed fairly from the urethra, and he was dismissed to go into the country in a very much improved state of health.

This remarkable case presents many features of interest, and although perhaps it ought to be placed in that part of this work which treats of external section, I deemed that it would not be out of place here; for it will be seen by a careful perusal that it illustrates the advantages which for a time, at least, may be obtained by the urethrotome.

It may be affirmed with truth, that in this case every variety of treatment which is useful for relieving stricture was put in force. In the first place, it is seen that his bladder had been punctured above the pubes for retention of urine: thus, it may be said that the *last* resource of surgery was in this instance adopted first. I was not able to ascertain by the patient's own account, but I suspect it may be assumed that an attempt was previously made to puncture the bladder by the peri-

neum, and that the surgeon, failing to get to the viscus in this way, had had recourse to the more easy method of puncturing the bladder above the pubes. This we can only conjecture : still, the fact is certain that a free incision had been made through the perineum.

Remarks on preceding case.

When admitted into the hospital, it has been seen that almost the first step the surgeon undertook was to get a free outlet for the urine, which was coming away in all directions, irritating and inflaming the tissues, and destroying the man's health. Consequently, a very free incision was made in the perineum, by which means the urethra was laid open, and, moreover, to the surprise of Mr. Fergusson, a calculus was discovered behind the strictured portion of the canal. The first step of importance was accomplished, and the patient was much relieved by it : the next thing was to get a passage through the stricture into the bladder; and as simple dilatation could not effect any good, potassa fusa was tried ; but, this also failing, as an ultimate resource internal section of the stricture was had recourse to, with immediate good effects. It was, however, necessary to apply the urethrotome twice before the stricture could be fully opened up.

Thus, in fact, to meet the emergencies of this case, there was a combination of all methods of practice, from the most simple to the most severe : and this shows the truth of what has before been stated, that no one line of practice will suffice for the treatment of stricture, and that it will sometimes be necessary to combine a variety of methods with the view of ensuring success in a single case.

But not only is this case interesting as regards treat-

ment, but in other points also it is instructive. It is a good instance of *traumatic stricture*, in reference to its progress, its great severity, and its obstinacy. It also illustrates the sad effects of the disease.

With the relation of this case I shall leave the consideration of the subject of internal division of stricture, feeling that it has been treated very inefficiently: but I am aware that its merits have not lately been so much canvassed by the profession as is the method of treating stricture by external or perineal section; to the consideration of which I shall next proceed, and upon which it will be necessary for me to dwell at much greater length.

CHAPTER IX.

TREATMENT OF STRICTURE BY EXTERNAL SECTION OF THE URETHRA.—THE *OLD* OPERATION OF PERINEAL SECTION.—CUTTING BEHIND THE STRICTURE.—TREATMENT OF RUPTURE OF URETHRA AND EXTRAVASATION OF URINE.

I NOW enter upon a most important part of the subject of the treatment of stricture of the urethra. In the last chapter, the method of remedying the disease by internal incision was considered; and it is now incumbent upon me to inquire into the merits of another method of removing the disease—viz., *external incision.*

In all ages since the subject of stricture of the urethra has been recognised and treated of, it has been found that certain severe and intractable cases have been met with in which ordinary measures have failed, and where it has been necessary to resort to external division of the contracted and diseased canal.

History of external section.

To this procedure of laying open the urethra from the outside, the term perineal section may be with correctness applied, for the incisions are made through the centre of the perineal region. The attention of surgeons in this country has of late been called much towards this remedy for the treatment of stricture; and from the various discussions which have taken place, it would appear as though it was only of late that this operative proceeding had been known and practised.

Prior, therefore, to entering upon the consideration of its merits, it will be useful to see how far external division of the urethra was known to the older surgeons and writers.

Wiseman.

The celebrated Wiseman, who practised surgery as long ago as the middle of the seventeenth century, was acquainted with the operation of opening the urethra in cases of retention of urine, as well as in impermeable stricture. The following is the account of a case which he witnessed and assisted in, the operator being a Mr. Molins:—

His case.

"An old fornicator having been long diseased with a *carnosity* which had resisted all endeavours, and in a manner totally suppressed his urine, sent for him. He went, and caused the patient to be taken out of bed, and placed upon a table with his legs drawn up, as in cutting for the stone. He cut into the urethra, near the neck of the bladder: it was hard as a gristle. His knife did not readily divide it; but so soon as he had, the urine gushed out; which being discharged, he put his finger into the urethra, and afterwards enlarged the incision upwards more to the scrotum; then dressed it up with his green balsam warm, by which, in a few days, it digested, and the patient was relieved: the lips grew also daily softer, and the wound healed apace. But all this while the urine had no other passage, *the common ductus being so closed up, by the reason of the carnosity*, that we could not make any way into it with our smallest probes or candles: upon which consideration it was thought necessary to keep this opening *in perinæo* for the discharge of urine; and in order thereto, it was dressed with a dossil, an emplaster, and compress, which

the patient took off at times to ease nature. But this not satisfying him, he frequently complained of his unhappy condition, insomuch that Mr. Edward Molins, being wearied with the patient's sollicitation, took me one morning along with him, when again he placed the patient as before, and attempted to make a way from the *apex* into the urethra; but it was in vain. Whereupon he caused one of his servants to hold the one leg and myself the other, while he took up the testicles, and put the one into my hand, and the other he placed in the hand of his servant; then with his knife divided the scrotum in the middle (we holding each testicle the while in our hands), and cutting into the urethra, slit it the whole length to the incision *in perinæo;* then with a needle and thread stitcht the skin over the urethra, as also the scrotum, leaving the testicles covered as before, and dressed them with agglutinatives, by which they were cured in a few days: but the urine, nevertheless, continued to flow by the opening *in perinæo.*"*

Remarks on it.

Now, there can be no doubt that this *old fornicator* laboured under impassable stricture, and consequent retention, and the operation was external or perineal section; for although the mode of proceeding was not exactly similar to that as done by surgeons of the present age, the principle was the same. The first part of the operation may be looked upon as a puncture of the bladder by the perineum; for, from the account, it would appear the urethra was opened just in front of this viscus, *behind* the stricture, and it was not until the second process that the true perineal section was performed.

* Wiseman's *Surgery*, p. 76.

It will be seen that the operation was done without any guide—that is to say, no instrument was passed down to the stricture prior to making the incisions.

Wiseman also mentions a case of his own where he performed a similar kind of operation—that is, he made a free incision through the diseased perineum into the urethra near the neck of the bladder. In this case I suppose that the stricture was not divided; for Wiseman states that the opening in the perineum remained, and that he gave the patient some bougies to endeavour to find a passage along the urethra.

Le Dran.

The celebrated French surgeon Le Dran records a case where he performed a species of perineal section for an inveterate stricture complicated with fistulæ and extensive disease in the scrotum and perineum. The operation was done at two sittings. At the first, Le Dran freely laid open the perineum till he reached the urethra. On the next day, he searched for an opening into the urethra by means of a bougie; and in the space of five days, having gradually got the bougie into the bladder, he slit open the canal behind the stricture as far as the neck of the bladder, making, says he, "the same incision as for the stone, and taking care to avoid the rectum." He afterwards passed instruments down the canal. The wound healed, and the patient got well. This operation was performed in 1730.

John Hunter.

John Hunter practised perineal section, and recommended it to be performed in cases where a false passage had been made, as also where effusion of urine had taken place. I shall quote his words in reference to the latter. After having described the bad effects of effusion of

urine, and speaking of the measures to prevent further mischief, he goes on to say—

"This must be done by an operation, which consists by making an opening into the urethra somewhere beyond the stricture, and the nearer to the stricture the better. The method of performing the operation is first to pass a director, or some such instrument, into the urethra *as far as the stricture;* then to make the end of the instrument as prominent externally as possible, so as to be felt, which in such a case is often difficult, and sometimes impossible. If it can be felt, it must be cut upon, and the incision carried on a little further towards the bladder or anus, so as to open the urethra beyond the stricture: this will be sufficient to allow the urine to escape, and to destroy the stricture. If the instrument cannot be felt at first by the finger, we must cut down towards it, which will bring it within the feel of the finger, and afterwards proceed as above directed."*

Hunter had previously, in the same work, described a proceeding he had adopted in a case where a false passage had been made. Here he cut upon the end of a grooved staff, which was previously passed down the urethra as far as the diseased part. The urethra being laid open beyond the stricture, the latter was penetrated by an iron piercer placed inside a canula. A bougie was introduced, and the man was ultimately cured.

Sir Charles Bell.

Sir Charles Bell, in his "Operative Surgery," published in 1807, described the perineal section as performed in cases of impermeable stricture and *fistula in*

* Hunter *On the Venereal*, p. 209.

perinæo. After having spoken of the disease, he says—

"This state of the parts requires a different operation, one ill to suffer, and requiring dexterity and niceness in the operator. The patient is placed in the position of lithotomy; a straight catheter or sound is introduced into the urethra down to the obstruction. Then a probe is introduced into the fistulous opening in the perineum. Often the straight probe will not follow the obliquities of the canal: it must be bent, and made, if possible, to hit upon the extremity of the catheter or sound. It cannot be made to touch the catheter, because the catheter is within the urethra, and *above* the stricture. The diseased integuments of the perineum are now to be laid open down to the tract of the urethra. If there is one sinus leading towards the stricture, it is to be followed; but if there are several, and they run deep backward, it is impossible or improper to follow them towards the neck of the bladder. In this part of the operation, a decided incision and a fair wound is to be wished for." Then Bell, after commenting on some of the steps of the operation, goes on to say—"If we should fail in attempting to introduce the probe into the fistulous communication, we must cut upon the stricture and the point of the staff; and now again searching with the probe for the continuation of the canal towards the bladder, and having found it, introduce the catheter from the point of the penis, past the stricture down into the bladder."*

Now, here is a strict description of the operation of external or perineal section.

* *Operative Surgery*, p. 121.

Dessault and Bichât.

In the Surgical Works of Dessault, edited by Bichât, are some observations upon the operation of opening the urethra from the perineum, under the name of *la boutonnière;* which proceeding, in fact, must be looked upon as similar to that already mentioned as the perineal section. The following are the remarks in reference to this point:—

"It is difficult, according to the meaning of ancient as well as modern authors, to form an exact idea of the operation of *boutonnière.* It is practised in so many different ways, and the operative proceedings offer so much contrariety and so little resemblance, that we cannot consider this object under any point of general view. The parts which are divided differ according to the place where this operation is practised; and this situation can only be determined by nature, and especially by the seat of the malady. Sometimes only an incision is made into the canal of the urethra, as in cutting for stone by the apparatus major; sometimes the incision is prolonged as far as the neck and the body of the bladder; and sometimes they cut into this viscus as in the lateral operation for stone. It is only in separately considering each of these methods that we can form a clear idea of the operation of *boutonnière.*"

The various processes of operation are then described:—"When we can introduce a catheter into the bladder, we make use of this instrument to make an incision into the canal upon its groove, and conduct a gorget, which serves to introduce the canula destined to remain in the bladder." Again:—"When we cannot succeed in passing a catheter, the operation becomes

much more embarrassing. Some practitioners advise us to open the urethra upon the point of this instrument carried down to the face of the obstruction, then to seek by the sound the natural opening of the canal, to thrust this sound across the stricture, and then to divide the contracted portion of the canal, so as to carry, by means of this incision, a canula into the bladder."*

Perineal section done many years ago.

It would be useless to quote further from the writings of the older English and French surgeons in reference to this proceeding; but these selections are sufficient to show that the operation of perineal section was performed many years ago by both, for the purpose of overcoming inveterate strictures, and relieving the effects which they produced when ordinary treatment did not avail. We find from these accounts that there were *two* chief methods of performing it: in the one, the strictured portion of the canal was laid completely open; and in the other, the chief feature consisted in cutting down through the perineum, and laying open the urethra *behind* the stricture. As the operation was practised for the relief of retention of urine, to remedy the results of effusion after the urethra had given way, and for the cure of perineal fistula, it is clear that the great object to be obtained was to get a free passage for the urine from the bladder; and in the one case the stricture was treated at the same time, and in the other the dilatation and removal of the stricture became a secondary consideration.

Operation as performed by modern surgeons similar to the old one.

The operation of external section, which has been resorted to by many British surgeons, and which has been

* *Œuvres Chirurgicales de Dessault*, tom. iii., p. 333.

recommended by some of the most eminent surgeons of the present age,—amongst whom I may mention *Astley Cooper*, *Liston*, *South*, and *Fergusson*,—is almost, if not entirely, identical with that described by Wiseman, Dessault, and Sir C. Bell; and it is now by some termed the *old operation* of perineal section, in contradistinction with a mode of procedure which has lately been introduced or revived, and to which reference will presently be made: and it will be seen that it is very necessary to make the distinction, in order to arrive at a correct appreciation of each particular measure.

Nature of operation.

As this proceeding is only carried out in cases of *impassable* stricture, the surgeon has no guide for carrying his knife along the urethra towards the bladder, but is obliged to be content with first passing a sound down the urethra until it is arrested by the stricture, and then to cut down upon its point. By this means, with care and dexterity, he is enabled to divide the contracted portion of the canal, and to carry the instrument into the bladder.

I shall now proceed to the consideration of those circumstances which render this operation necessary or expedient.

Circumstances rendering it necessary.

At the outset, it may be affirmed that the operation of dividing a stricture from the perineum is *not necessary* in cases where an instrument can be passed into the bladder. Surgeons have generally acted upon this conviction in putting this proceeding in force.

It is not, however, in instances of stricture which are simply impermeable to an instrument that the operation is either necessary or justifiable; for, as I have before stated, the surgeon possesses in caustic a very

efficient remedy for this condition, even if he has been unable by assiduous care to overcome the stricture by dilating instruments. But, before the employment of a severe measure like perineal section is warranted, certain pathological conditions must obtain which render the case complicated, and rebellious to other plans of treatment.

In the first place, then, this operation is necessary in those cases of stricture where the disease has existed for a long time; where a considerable extent of the urethra has become so contracted that the urine only passes in drops; where there is extensive induration along the course of the canal, in the perineum and scrotum; and where, with all these changes, the surgeon is unable to pass a catheter. In such a case, the patient suffers very seriously if relief is not given; the irritation, both local and general, wears him down, and brings him to a pitiable condition; most probably, fistulæ have already formed, or will form, and then the induration of the tissues becomes greater from the urine constantly trickling along the sinuses.

Impassable stricture.

In such a case, the surgeon, perhaps, tries many times to introduce an instrument, and fails. It is his duty then to resort to some other measure; and the most effectual mode to pursue is to lay the diseased textures freely open, and at the same time divide the whole contracted portion of the urethra. By this means, a free outlet is made for the urine, the stricture is at the same time destroyed, and, in the majority of cases, complete re-establishment of health takes place.

The next condition for which this operation has been

usually performed—and when even it is more necessary—is where the urethra has given way behind a close stricture, infiltration of urine and suppuration have taken place, and the patient is brought thereby into such a state that life is endangered. I am not here speaking of those very terrible cases of extravasation where excessive suppuration and sloughing have ensued, and where all the mischief has occurred, perhaps, within a very few hours: of these I shall speak by-and-bye: but I allude now to those instances in which infiltration takes place more gradually, and the mischief is more circumscribed, yet the case is sufficiently urgent to demand the operative measure. Here, indeed, a free incision in the perineum will permit of the escape of the confined fluids, and will bring the patient out of his sufferings: but, in order to make the remedy more complete, it will be necessary to remove the stricture at the same time; and this can only be properly effected by carrying the knife deeper into the canal, and opening it at the point of a sound.

Infiltration of urine and abscess.

It is, for the most part, in such cases as these above mentioned that surgeons have hitherto practised the operation of perineal section. There are other circumstances under which this proceeding has been adopted, to which I shall presently allude; but, before doing so, I shall detail some cases of the operation under the conditions I have just mentioned.

Case I. A. H——, admitted into King's College Hospital, June, 1850, aged thirty-nine. Seven years since, he first felt the symptoms of stricture, the result of gonorrhœa: he had never used injections. As time advanced, his water passed with great difficulty. Fif-

teen months ago, extravasation of urine, as far as I could learn from the patient's account, occurred, and he was admitted into hospital, and incisions were made, and he recovered. A catheter was not passed until three weeks after the operation, when one was introduced under chloroform. He did not remain long in the hospital after this. A fistulous opening remained in the perineum where the incision had been made; the difficulty in passing water became more striking, and at the end of some months more he entered the same hospital. He states that a No. 8 catheter was introduced and kept in the bladder for twenty days, when it was withdrawn with exceeding difficulty, its extremity being incrusted with a substance like an "oyster-shell." After this, only No. 3 was passed. He now left the hospital, and returned to his work, not paying any attention to his malady till the early part of June, when he noticed one day that his scrotum was swelled very much, and that the integuments were of a dark red colour. He then came into the hospital, under Mr. Fergusson. At that time he was suffering acutely from irritation: the scrotum was uniformly swollen to the size of a foot-ball; his urine dribbled away from a fistula in the perineum. A free incision was at once made into the centre of the swelling, and an enormous quantity of pus and urine escaped: the patient at once began to rally, and in a few days nearly all disturbance had ceased. Patient attempts were now made on several occasions to pass an instrument through a very tough stricture at the bulb, but without success. There remained a great amount of induration of tissue in the perineum and scrotum, and one or two fistulous open-

ings, by which most of the urine escaped; the urethra also was exceedingly irritable: it was, therefore, determined to divide the stricture from without.

On July 6th, the patient inhaled chloroform, and was tied up as for lithotomy; a No. 8 silver catheter was passed down to the stricture, and retained there by an assistant. The operator then made a very free cut through the perineum, which included the fistulous opening, until he reached the urethra, which was opened at the point of the catheter, just in front of the stricture. Some more careful touches by the knife were now made, the catheter was urged forward until the whole extent of the stricture was divided, and the instrument was carried into the bladder: this was withdrawn, and a full-sized gum-elastic one was tied in.

July 8th.—The patient has been doing well: pulse 96; urine comes away freely by the wound, and by the catheter.

13th.—Catheter removed, as it had been giving some irritation; its extremity was coated with phosphates: another large gum-elastic catheter was tied in. Patient doing admirably.

16th.—No. 12 gum-elastic catheter introduced: wound is granulating well: the patient is recovering his strength and spirits admirably; he eats and drinks well.

22nd.—The instrument last introduced caused some œdema of the prepuce and scrotum: it was, therefore, taken out. The wound is much contracted; little urine passes through it, but the patient is able to pass it in a good stream from the urethra.

August 6th.—Wound almost entirely healed; all the parts in a most healthy condition; the urine does not

flow at all from the wound, but it is passed entirely in a full stream from natural canal.

20th.—Patient has entirely recovered his health: a full-sized catheter can be passed with ease; there are no remains of stricture, and he is to be dismissed.

Case II. Joseph P——, aged thirty-five, was admitted into King's College Hospital, December, 1848. He was suffering under symptoms of severe fever, having had rigors, followed by severe depression. He was placed under the care of a physician, who, after treating him for fever for several days, at last discovered that there was a swelling in the perineum, and that the man had suffered with symptoms of stricture for some years. During the last few weeks his urine had escaped with great difficulty, and occasionally there was complete retention. He was now transferred to the care of Mr. Fergusson, and, on examination, it was discovered that there was great swelling and induration in the perineum. An attempt was made to pass a small catheter, but it was stopped at the bulb. This man was in a bad condition: his pulse was quick and feeble, his tongue was brown and dry; countenance anxious. In this condition the patient was carried into the operating theatre on December 30th, and placed under the influence of chloroform. A No. 6 silver catheter was passed down to the stricture and held by an assistant, the patient being previously placed in lithotomy position. A free incision was made through the centre of the perineum, and a quantity of pus and urine was let out: the tissues were in a very thickened condition. The urethra was next opened, and the stricture, which was

hard and cartilaginous, was with difficulty divided. The catheter was then pushed on into the bladder, and secured there. There was not much blood lost during the operation, but it lasted more than twenty minutes.

January 3rd.—This man's feverish symptoms are all gone; but the catheter gave him a good deal of irritation on the second day, and he induced a patient in the next bed to extract it. The wound looks well, and the urine escapes freely from it.

8th.—Patient doing admirably. No. 8 catheter passed to-day, and kept in the bladder for only twenty minutes, as its presence causes irritation. Wound looking well; tissues of perineum much softer.

11th.—Wound closing: half the urine, at least, passes by the urethra. Catheter passed to-day, and retained for one hour and a quarter.

16th.—Wound all but closed: very little urine passes by it.

25th.—No. 10 catheter passed very easily.

31st.—Urine passes freely by the urethra. No. 10 passed with great ease, and the wound in the perineum is quite healed. The patient has become quite robust, and is to be dismissed.

Case III. Mr. G——, aged thirty-five, came under my observation October, 1849. He was at this period suffering severely from the effects of stricture; he was confined to his bed. The scrotum and perineum were much thickened and infiltrated; and there were several fistulæ, by which the urine flowed.

Attempts had been made on several occasions to pass

instruments of various sizes, but uselessly; they were stopped at the bulb. This patient had had stricture for many years, and had undergone a long and painful course of treatment at the hands of various practitioners. One surgeon of great experience had at last tried for three months to overcome the stricture, but was always baffled. At the end of this period, the patient got weary of treatment and neglected himself; and soon after extravasation of urine occurred, and nearly killed him. Very free incisions were made, and he rallied; but the stricture had not been divided, and so he recovered with it as bad as before; and, in addition, with several fistulous apertures in the perineum, and extensively diseased state of the tissues. He continued in this miserable state some time longer, when his patience became exhausted, and he resolved to submit to an operation. His surgeon requested my assistance.

The patient was placed under chloroform, and tied up as for lithotomy. A silver catheter was then passed down to the stricture, and retained there. A free incision was made through the perineum: by this a large quantity of pus and urine was evacuated. The tissues were enormously thickened. The urethra was next laid bare, and opened with difficulty, the strictured portion being long, hard, and gristly: but the instrument could not be got into the bladder; a gum-elastic catheter was therefore substituted; and this was carried into the bladder, and retained there in the ordinary way. There was not much bleeding during the operation. This patient had not a bad symptom, but made an excellent recovery. I saw him three months after the operation,

looking well and hearty; but he took the precaution to wear a gum-elastic catheter in his urethra, to prevent it contracting.

Case IV. Captain S——, aged forty-three, came under my notice in the summer of 1851. He had suffered from stricture for fifteen years, and had neglected it very much; and the difficulty in passing water became, since the commencement of the year, very distressing; and in March, extravasation of urine occurred, and placed his life in great danger. Mr. Fergusson saw him, and made very free incisions into the scrotum, and let out a quantity of urine and pus; but all the attempts to pass a catheter failed. This gentleman rallied from a dangerous state, and all the urine passed away from the opening in the perineum.

In July, further attempts were made to pass a catheter, but vainly. The sinus in the perineum resulting from the incision made some time back still remained, and the tissues of the part were in a much thickened and indurated condition. The patient's health suffered much from general irritation: it was, therefore, determined upon to open the urethra.

Accordingly, on July 15th, the patient was placed under chloroform, and was tied up as for lithotomy; and a large silver catheter being passed down to the obstruction, was held against it. A free incision was made through the centre of the perineum: the stricture was next divided. A full-sized elastic catheter was passed into the bladder, and retained there.

This patient rallied well from the operation. The catheter was borne in the bladder with ease, being only

changed three times in five weeks. At the commencement of September, Mr. Fergusson put him under my care, and I was enabled to pass a No. 10 catheter into his bladder. There were not any remains of stricture. The health of the patient became perfectly restored, and he was enabled to pass water in a full stream.

Remarks upon these cases.

Now, in these four cases we have good examples of the effects of the old operation of perineal section, and of the conditions of the malady in which the remedy should be adopted. In all and each of them did those circumstances obtain which do not admit of any other treatment short of that which was put in force. It has been seen that, in these cases, stricture had persisted for a length of time varying from seven to fifteen years. The symptoms in each case had been neglected for a long time, and all those bad results which have been before spoken of were noticed. It will also be observed that these cases resembled each other in this one particular—viz., in all of them extravasation of urine had occurred some time before the operations were put in force; matter had formed; incisions were made; fistulous apertures had remained, which served as conduits for the urine, and thus kept up extensive disease in the textures of the perineum and scrotum.

In the *first* case, extravasation had taken place on two different occasions. The first time it was fifteen months prior to the patient coming under my observation, at which period, as stated in the report, he was suffering from an enormous urinary abscess. This was evacuated for the purpose of giving the man some relief, and he

was allowed to remain quiet for a short time previous to a more formidable operation being performed.

The *second* case was not exactly analogous to the others; for here there were no fistulous openings, and the patient was operated upon under somewhat different circumstances from the first. The patient had long laboured under bad stricture; extravasation and urinary abscess had suddenly occurred; fever of an intermittent type had followed; and the medical attendant was entirely mistaken about the nature of the disease. In order to rescue the patient, it was necessary to evacuate the matter which had formed in the perineum in consequence of the urinary infiltration; and it was deemed prudent to lay the contracted portion of urethra open at the same time, and thus complete in one operation that which is generally done on *two* occasions. Thus, not only were the effects, but the cause also of all the mischief was removed at the same time, and the superiority of this mode of practice is well illustrated by the success of this case.

The *third* and *fourth* cases closely resembled one another in the circumstance of infiltration of urine, and of abscess having occurred only a few months prior to operation, and of these accidents having been followed by the usual result when the stricture is not divided at the same time that the matter is evacuated. It is to be presumed that, when suddenly great swelling and inflammation of the scrotum and perineum takes place, as occurred in such cases, the urethra has been opened by ulcerative absorption, and extravasation of urine has occurred: consequently, if at this time an incision is made to relieve the more imminent symptoms alone,

and the stricture is not divided at the same time, the urine finds its way through the opening made, and a fistulous aperture is formed, and will remain until the stricture is destroyed; and, in consequence of the continual trickling of the urine over the parts, the tissues of the perineum and scrotum become so thickened and hardened, that it will be necessary to lay them freely open, as well as to divide the contracted portion of the urethra; otherwise a satisfactory cure cannot be effected. At all events, there are no cases in which the good effects of the *old* operation of perineal section are so decidedly marked as in those above mentioned. Each of these patients was in a most miserable state, and all were restored, comparatively speaking, to a condition of perfect health.

Other conditions in which this operation is necessary.

There are other cases where the operation is considered necessary, and where I have seen the very best results follow. They are, indeed, very similar to those just related; only, perhaps, a sudden attack of extravasation has not occurred, but the patient may have laboured many years under severe stricture. In consequence of some unusual irritation, added to the gradual effects of the disease, suppuration may have taken place gradually outside the urethra; the abscess has burst, or has been opened, but the opening has never healed; the fistulous aperture or apertures, by which nearly all the water passes, remain; and as the bladder expels its contents, a small quantity of urine escapes from the canal, which has ere this become opened behind the stricture; further condensation of the parts takes place, and an operation is required.

Case V. John L——, aged forty-three, of irregular habits, admitted into King's College Hospital, June, 1849, with stricture and perineal fistula. About twenty years ago, he first had symptoms of his disease, which came on six months after an attack of gonorrhœa. He has occasionally been under treatment, and obtained some relief; but latterly his disease has advanced. About twelve months since, he became very much worse; and on one occasion, after getting wet through, he was very ill; and he noticed that his scrotum swelled, and that his water passed with much greater difficulty.

On admission, he was in a very bad state: his health was very much shattered. There was a stricture situated at the bend of the urethra; the textures of the perineum and scrotum were much thickened, and a fistulous opening existed, from which a quantity of pus flowed, and from which also the urine came away. Attempts were made by Mr. Fergusson to pass instruments, but it was found impossible to pass any one: it was, therefore, deemed necessary to divide the stricture.

June 16th.—The patient was placed under chloroform, and tied up as for lithotomy. A catheter being passed down to the stricture and retained there, a free incision was made through the centre of the perineum, and the contracted portion of the urethra was divided at the point of the catheter. A great deal of difficulty was experienced in getting the instrument along into the bladder; but a No. 6 was at length introduced, and tied in. There was smart bleeding during the operation.

26th.—Patient doing admirably. The catheter has not yet been taken out.

July 6th.—The catheter has been taken out for several days: to-day another was passed, and allowed to remain in. The wound is nicely contracting, and the patient is regaining strength.

15th.—No. 10 catheter has been introduced. From this date he went on well, and in a few days was enabled to pass water in a full stream. He was shortly afterwards discharged in a good state of health.

Rupture of urethra.

Another condition in which the propriety and necessity of cutting down upon the point of a catheter is apparent exists when the urethra has been ruptured by a violent blow, and when the effects of such an injury are produced with rapidity and severity. In most, or at least in many of such cases, serious results do not happen directly after the injury; but in some such cases enormous extravasation of blood may occur immediately afterwards. Retention also occurs, and infiltration of urine takes place as well in the cellular tissue of the scrotum.

Such an operation, then, is necessary, not only to evacuate the extravasated blood and urine, but also for the immediate purpose of getting a catheter into the bladder, for it will be almost impossible to do so when the urethra is lacerated; but if a free incision is made through the perineum upon a full-sized catheter, first carefully passed as far as the point of injury, the instrument can be carried into the bladder, and the patient be placed in safety.

Case VI.

John W——, aged thirty-five, was brought into King's College Hospital, when I was house-surgeon, August, 1846, late one night. He had a few hours previously fallen on his perineum across a low door.

He was soon seen by a surgeon, who attempted to pass a catheter; but he could not do so, and the patient got very bad. When he came into the hospital, I found that a considerable quantity of blood was coming away by the urethra, and that there was complete retention of urine. The bladder was very much distended, and there was very great suffering on the part of the patient. There was a large swelling in the perineum, and the whole of the scrotum was enormously distended and ecchymosed from effused blood. I at once made cautious trials to pass a catheter, but could not get its point beyond the bulb. I therefore sent for the surgeon of the day, who arrived, and having made fruitless attempts to introduce a catheter, passed a sound as far as he could, and then cut upon its point. A large gum-elastic catheter was then passed along the urethra into the bladder, and retained there. An immense quantity of bloody urine was drawn off: the poor patient experienced great relief. Hot fomentations were ordered, and a large dose of laudanum was given. Next day the patient was better. I extracted the catheter, introduced a fresh one, and tied it in. For several days I introduced a new catheter, and nearly all the symptoms of constitutional irritation went off, and the man appeared to be rapidly recovering; but at the end of a week the care of this case was taken out of my hands. Another surgeon attempted to pass a catheter, found extreme difficulty in doing so, and produced great pain and irritation: the instrument was consequently not passed for four days, by which time excessive constitutional disturbance had set in. This man

became much depressed; a regular attack of urinary fever occurred, and in a few days more he died.

Remarks on this case.

In this unfortunate case, the termination of which I very much deplored, we have an illustration of the effects of a rupture of the canal from external violence, and of the necessity of cutting down upon the urethra, for the purpose of relieving the bladder, and at the same time evacuating the blood and urine which had been extravasated. In this case complete and immediate relief from intolerable suffering was produced, and everything went on well until the prolonged and forcible attempt to pass a catheter produced excessive irritation. This was kept up in consequence of there not being a free passage for the urine; and it is probable that fresh extravasation took place, and led to the fatal result, which I firmly believed would have been avoided if improper interference had not been made.

The operation necessary in traumatic stricture.

Another condition in which this operation is sometimes found necessary, is where a stricture has resulted from an old injury to the urethra, such as arises from a fracture of the pelvis. I have in a former chapter dwelt upon traumatic strictures, and have stated how extremely intractable such cases are. It is not very often that ordinary dilatation will suffice to open up the stricture, and the speediest method of gaining relief is to cut down through the perineum.

Case VII.

John W——, aged thirty-seven, admitted into King's College Hospital, October, 1848, with impassable stricture, the result of a fracture of the pelvis. He states that in May, whilst working on the railroad, a mass of earth fell upon him, thrusting him with much force

against an iron implement which he was using. The immediate consequence of the accident was complete retention, for which the catheter was employed: after this the urine only dribbled away in a very small stream, and he did not appear to have any power of retaining it. The patient was taken to a provincial hospital, where various attempts were made to pass a catheter, but its introduction could not be accomplished.

When admitted, his water passed only in drops, and the act of micturition was performed with great pain and difficulty: the urine was very thick and purulent.

Attempts were made by Mr. Fergusson to pass a catheter on several occasions, but vainly: each time the point did not go further than the bulb. As, therefore, so many previous attempts had been made, and the patient was suffering so much, it was determined upon to open the urethra.

November 10th.—The man being placed under chloroform, was tied up as for lithotomy, and a free incision was made through the perineum, down upon the contracted portion of the urethra, which was divided. A catheter was then passed in, and retained there.

11th.—Patient doing well: urine passes freely through the wound.

13th.—Catheter removed, as some irritation was produced.

20th.—Patient doing well. An attempt was made to pass the catheter, but it was obstructed at the old spot. An attempt was again made on November 28th and December 5th, but with the same want of success; and as the patient began to decline in health, and suffer

from irritation, it was thought desirable to make a free passage for the urine: therefore, on December 15th, another free division of the urethra was effected at the point of a catheter, and every portion of the canal which appeared to resist the free passage of the instrument was divided. A large gum catheter was then passed, and tied in.

21st.—The catheter was withdrawn the fourth day after the operation; and after this the man was able to pass his water in a full stream by the urethra: and yesterday the catheter was again passed.

23rd.—Catheter again withdrawn, and again passed without difficulty. Wound is looking well, and is healing. From this date the patient did well—was enabled to pass water in a full stream. The catheter was occasionally introduced. The man, finding himself so much improved, went out of the hospital January 1, 1849.

Remarks on preceding case.

In this case is presented to us one of the most troublesome forms of stricture. Laceration of the urethra is often caused by fracture of the pelvis; and very frequently these cases are followed by death: and, indeed, it is a rare thing to see an instance of stricture which was originally produced by fracture of one or more of the bones of the pelvis. It is impossible to say whether, in this case, the laceration of the urethra which must have taken place was actually caused by the fractured bone being driven forcibly against the canal, or whether the same iron instrument against which the man's pelvis came in contact had not ruptured the urethra at the time that it splintered the bone. Nevertheless, we may consider this as a case of stricture of the urethra *after* fracture of the pelvis.

As there was such a great obstruction to the passage of a catheter whenever any attempt was made to get it into the bladder, it was considered reasonable to suppose that a displaced portion of bone might still be pressing against the canal, and causing this obstruction. But this was not the case; and from this there is some reason to suppose that the injury to the urethra was caused by the foreign body which came into contact with the pelvis.

The second operation was rendered necessary, in this case, probably from the circumstance that the whole of the obstructed portion of the urethra had not been divided in the first operation.

Calculus impacted behind stricture.

The opening of the urethra by the perineum at the point of the catheter is also necessary in a case where a stone has become impacted behind a stricture. It will be well, in such a case, to cut freely down upon the urethra where the stone is felt, to remove this, and then divide the stricture from behind forwards.

In sudden extravasation of urine.

This operation is also absolutely necessary in those very bad cases of extravasation of urine which have occurred suddenly from rupture of the urethra, and where, in the course of not many hours, extensive sloughing is produced by the urine infiltrating itself into the tissue of the perineum, scrotum, and groins. It is necessary to make very free incisions into the diseased textures, and, if possible, to open the urethra at the seat of stricture as well, so as to permit of the introduction of a catheter into the bladder. But it is not always possible to effect this when the

parts are in such a disorganized and diseased condition; and sooner than exhaust the patient in vain and prolonged attempts to divide the stricture, the surgeon must be content with freely laying open the diseased parts, and cutting into the canal *behind* the stricture, if this is possible. If he cannot find the canal, he must be satisfied with letting out the effused matters. Whenever the strictured portion can be divided, it should be effected. Unfortunately, most of these cases are seen in broken-down constitutions, and individuals who have long suffered from stricture. Not unfrequently, they neglect themselves, or are grossly neglected by practitioners who know not the source of the mischief. The following is an instance of this nature:—

Case VIII.

I was hastily summoned, May 2nd, 1851, to a wretched abode in an unhealthy alley, where I found a poor man, aged about fifty, apparently *in extremis*. On turning up the bed-clothes, I found his perineum and scrotum enormously swollen, and of a dark colour; and in each groin was the same dark appearance. He was suffering intense agony. The urine was dribbling away from the urethra in drops: countenance very anxious; pulse rapid. It was evident that the urethra had given way, and that extravasation had occurred, and had produced the mischief. The swelling and other severe symptoms had only appeared the night before; but he had been laid up with a so-called *fever* for more than a fortnight, and at the same time had found increased difficulty in making water, he having suffered with signs of stricture for years. A physician attended the man with his *fever* until the present symptoms set

in, when I was sent for. I immediately tried to pass a silver catheter down the urethra; but finding I could not get it through the stricture, which was seated at the bulb, I cut fairly through the centre of the perineum, and evacuated a large quantity of matter and urine. I then opened the urethra at the point of the catheter, and tried to carry the catheter into the bladder; but I could not succeed in passing it in, and as there was now a free outlet for the urine, and as the man was not in a condition to stand much more interference, I did not persist in the attempts, but made some free incisions into the scrotum, put the man into his bed, and ordered him some stimulants and opium.

Next day I found him wonderfully better. He had passed a very fair night, and was in no pain. The urine came freely by the wound, and the parts were much less swollen. Pulse 92, pretty firm.

For five days after this operation, the man continued doing well. He improved in his appearance and spirits, the urine came freely away by the wound in the perineum, and I had strong hopes of his recovery; but, unfortunately, he lay in a very wretched and dirty lodging, without the common comforts of life: it was extremely difficult to keep him clean. Sloughing attacked the penis and scrotum; the pulse rose; diarrhœa set in, and in another day or two destroyed the patient.

Up to the last, the urine came away freely through the opening made in the perineum, and not any fresh infiltration took place; and I believe, if the patient had been placed under better circumstances, that he would eventually have recovered; for the relief which he obtained

from the operation was most striking. And although these terrible cases of sudden giving way of the urethra behind a stricture are too frequently, from concomitant circumstances of a shattered constitution, neglect, and delay, and the consequent disorganization which is produced, followed by speedy death, the surgeon sometimes has it in his power to save life by a bold and timeous operation, consisting in laying the diseased parts freely open, and in cutting through the strictured portion of the urethra at the point of a catheter.

General remarks on the operation.

I could relate many more cases which I have most assiduously watched, if it were necessary; but from the foregoing, it will be seen that the operation of opening the urethra at the point of the catheter, in cases where an instrument cannot be passed through the obstruction, is a proceeding attended with the very best results. Those only who have watched many of these cases from beginning to end, and have been able to contrast the state of the patient after a successful operation with their condition before, can form a just idea as to the value of this measure; for it must be borne in mind that it is only in the very worst forms of stricture of the urethra, and in those complicated with rupture of the canal, perineal abscess, and fistulous openings, that this operation is called for. And although it has been stated, on the authority of Mr. Syme, that an instrument can be passed through any stricture, that the term *impermeability* ought not to be applied to any such case, and that therefore this *old* operation should never be adopted, we require something more than this mere assertion to convince us of its truth, when we know that cases are frequently met with which have baffled

the skill and patience of most accomplished surgeons. And if we bear in mind how much changed the parts become from disease, how distorted the urethra may be from various causes, it will appear a most startling assertion to make, that it is always possible to guide a catheter through the natural passage into the bladder. If this could be effected, I will then affirm that this operation would be rarely necessary: but when I have witnessed repeated attempts made by careful surgeons, and have seen these attempts repeatedly fail, I cannot believe it is possible to carry an instrument through *any* stricture into the bladder without at least using such an amount of force as would be unjustifiable.

In all the cases above related, patient attempts had been made to pass instruments before the operation was resorted to: and, indeed, in every case, whether of extravasation of urine or of *fistula in perineo*, the surgeon should endeavour by all means to get a catheter into the bladder; for if he can do so, the necessity for an operation will cease—or if it is necessary, the difficulty of the proceeding will be much less.

The difficulty of performing it.

And in reference to the difficulty in completing this operation, it is not to be denied that it may be attended with the utmost difficulty; and there are several instances on record where the patient has been carried to bed after the surgeon had been in vain endeavouring for a long period to divide the obstructed canal, so as to admit the passage of a catheter. I have now witnessed this operation a great number of times, and although I have seen a most accomplished surgeon on the point of sending his patient away with the operation unfinished, it has only once occurred to me to witness this actually

take place; and this was in the case of the patient operated on by myself for extravasation of urine. But it is true that I did not persevere long, because my object of getting a free passage for the urine was accomplished, and there was not the necessary assistance at hand for such an emergency.

Its good effects.

In by far the majority of cases which have fallen under my notice, a speedy restoration to health has been effected; and the return from misery to enjoyment of life has been most striking. But still, this proceeding is one which may be rapidly attended with serious and even fatal consequences, from the shock given to the system alone; or death may result from this operation, as it will after any other, either from the supervention of erysipelas or of tetanus, which must be looked upon as accidental circumstances, and not inherent to the particular proceeding itself. I have seen *three* deaths occur after this operation where there was every reason to hope for a favourable termination, and where, certainly, there was not enough of disease to destroy the patients. Of these three, I shall only detail at any length the one which is most striking. In the first instance, the patient was a man in the prime of life, who had impermeable stricture and fistulæ. Here the operation was done, and in a few days the patient was seized with erysipelas, and died from it. In the second instance, a fine young man, between twenty and thirty, suffering with impermeable stricture without any complication of abscess or fistulæ, was operated upon. There was great difficulty in the operation. Soon afterwards he became much depressed—was seized with vomiting, which could not be allayed, and he died in two weeks.

May be fatal.

In neither was there bleeding of consequence. The *third* fatal case was as follows:—

Case IX. Thomas S——, aged thirty-six, admitted into King's College Hospital, March, 1850. Has had stricture for ten years. A year ago he suffered from complete retention, and since this period his urine has only dribbled away. He had not had an instrument of any description passed since seven years.

On examination, a very hard and tight stricture was found just in front of the bulb; and although patient endeavours were made to get instruments into the bladder, progress was not made; and the man suffered so much from difficulty in making water, that it was determined to divide the stricture.

April 23rd.—The patient was placed under chloroform, and tied up as for lithotomy. A silver catheter was passed down to the stricture, and held there; an incision was made by Mr. Fergusson through the centre of the perineum upon its point, the urethra was opened, and the stricture was divided. There was a good deal of difficulty in the operation, but not much bleeding.

The patient progressed satisfactorily until the morning of the 28th, when he somewhat suddenly complained of feeling depressed, and his face looked haggard; but he did not complain of any pain, and the wound looked very well. Next day he was worse, without any symptoms but those of depressed power; and on the 30th, at half-past five, he died. On post-mortem examination, there was not anything found to account for death.

Remarks on fatal cases. Now, here was a second instance of death resulting from an operation in a patient who was in robust health (excepting his stricture); and the fatal result

in this instance was the more to be regretted, because the operation was not absolutely necessary. It is true that the case was severe. The stricture was impermeable, but there was not any complication of abscess or of urinary fistulæ—the conditions which almost alone, in my humble opinion, justify the resort to cutting on the point of the catheter.

The results of this case, and of the one preceding, forcibly arrest the attention, and lead one to the conviction that this operation should not be rashly resorted to in cases of uncomplicated stricture, and where there are no very urgent symptoms to call for it; and, more especially, it should not be adopted until a fair trial has been given to potassa fusa. In neither of these unfortunate cases was this remedy tried; and from what I saw of them, and from my own experience in the use of caustic, I feel firmly convinced that a few applications of it would have overcome the stricture in each case, and that cutting would not have been required. It is a fearful thing to send a comparatively healthy man into the other world by an operation which is not rendered necessary by circumstances. Moreover, by employing this operation in such uncomplicated cases of stricture, discredit is brought upon a proceeding which is absolutely necessary, and most productive of benefit, in instances of stricture where life is placed either in hazard or in the greatest misery from the concurrence of infiltration of urine, of diffused abscess, or of their results, perineal fistulæ and extensive disease of the tissues of the part. And, somewhat curiously, my own observation of many cases has shown me that the operation is most signally successful in instances of this nature,

and where the system has been for some time in a condition (if I may so speak) of urinary irritation; whereas in *two* out of the *three* cases of the operation where it was not necessary, and where this condition did not exist, a fatal result followed in a few days.

Inquiry as to permanent good effects.

Now, it is well to say a word or two in reference to the *permanency* of the remedy; for in every kind of treatment this is a point of great importance.

In the case of Joseph P——, I had an opportunity of satisfying myself that the good effects of the operation lasted for a year at least; for in January, 1850, I saw him, and was able to pass a No. 10 catheter into his bladder, and he had had no instrument passed since the operation. So this is very satisfactory.

Captain S—— called upon me *nine* months after the operation. He passed water in my presence, in a full, unbroken stream, and was in every respect well; and, as in the other case, there was no fistula. He had had an instrument passed *once* or twice only since the operation.

As to John L——, I heard that he remained perfectly well in August, 1850, upwards of a year after the operation, but that he took the precaution to pass a bougie occasionally.

The result of these cases is so far satisfactory; but I am compelled to say that I have seen more than one instance where re-contraction has taken place to a considerable extent not long after the operation, where the patient has not taken the precaution to pass an instrument. Therefore, it would be foolish to expect a *cure* from this operation; for the disposition to contraction still remains in the part originally diseased, and it is

the duty of the surgeon to impress upon his patient the necessity of his continuing the use of a bougie occasionally during his lifetime.

Perineal section *behind* stricture.

Cutting through the perineum behind the stricture is a modification of perineal section considered by some to be a proceeding far preferable to that I have just been speaking of. Mr. Guthrie was a great advocate of this method, and has fully described it in his work on the Urethra, and more lately recapitulated the evidence in its favour in the Lectures which were delivered before the members of the London Medical Society in 1851. Mr. Simon also, of St. Thomas's, has, in the *Medical Times and Gazette* for 1852, forcibly dwelt upon the advantages of this operation, and its superiority over that just considered. It is principally, however, in cases of retention of urine from impassable stricture that it is recommended.

Guthrie.

Simon.

In its performance therefore, the surgeon has *two* objects in view. The *first* is to relieve the bladder of its load of urine; the *second* is to divide the stricture through the wound made in the perineum from behind forwards: so that, in the end, the same object is gained as is effected by the operation lately discussed.

Applicable in retention of urine.

In *certain* instances of retention of urine, it is a proceeding which is calculated to be of great service, and one which may be effected with greater facility than the other method; for in some of these cases the membranous portion of the urethra will be dilated behind the stricture, and can be readily opened. But in the majority of instances there is no such guide; and if there is much induration and disorganization of the textures over the urethra, and if abscess exists at the

same time, there will be considerable difficulty in hitting the canal. Mr. Guthrie recommends the division of the stricture at the same time that the operation is performed; but Mr. Simon merely has in view the immediate relief of the patient from the effects of retention, and does not divide the stricture, but leaves it to be dilated by instruments; which measure can be more readily effected after a free passage has been made for the urine from the bladder, as it no longer irritates the stricture.

I shall again have to refer to this proceeding whilst speaking of the treatment of retention. I may here mention that the operation of opening the urethra between the stricture and the bladder was practised, or at least recommended and described, by the older surgeons. In the third volume of Dessault's "Surgery," at page 333, it is spoken of:—"When urinary fistulæ exist in the perineum, it is proposed to follow another proceeding for the operation of *boutonnière*. This proceeding consists in introducing a bougie by one of the fistulæ until it is made to penetrate the canal, and from thence into the bladder; then to substitute for the bougie a grooved sound, and to divide, by the aid of this sound, all the parts comprised between the fistula and the neck of the bladder." And the following is the appreciation of it:—"This operative proceeding hardly appears rational. The incision made *behind* the obstacle, and placed between the stricture and the bladder, does not touch the *cause* of the evil; and to arrive at a radical cure, it will always be necessary to return to sounds introduced by the urethra

This plan known to Dessault.

to destroy the obstacle, the primary cause of the fistulæ."

From this it appears that the main objection of the French surgeon to this proceeding was, that it did not remove the *cause* of the mischief: and it certainly seems rational that if the urethra is cut into *behind* the stricture, the division of this obstruction would at least not add much to the difficulty of the process, and would at the same time efficiently remove the stricture.

John Hunter was fully aware of the operation of dividing the urethra between the stricture and the bladder:— John Hunter.

"If the stricture in the urethra be opposite to the scrotum, it being impossible to make the opening there, it must be made in the perineum; in which case there can be no direction given by an instrument, as one cannot be made to pass so far; therefore we must be guided by our knowledge of the parts. The opening being made, the stricture is to be searched for as described in the operation in cases where a false passage has been made, by passing a probe from the wound forwards towards the glans."*

METHOD OF PERFORMING THE OLD OPERATION OF PERINEAL SECTION.

The patient having been prepared for the operation, and having been placed under the influence of chloroform, is secured upon the table as for lithotomy. A

* Hunter *On the Venereal*, p. 209.

silver catheter or grooved sound, of a size equal to No. 8 or 10, is passed along the urethra to the face of the stricture, against which it is firmly held by an assistant. The surgeon then, sitting in a chair opposite the patient, makes an incision from two to three inches in length, through the mesial line of the perineum, with a straight and strong bistoury—divides the thickened tissues freely until he comes down to the urethra, which he opens at the point of the catheter. He then makes some further touches carefully with his knife so as to divide the stricture, and at the same time carries the catheter onwards until he is enabled to introduce it into the bladder. During the latter part of the operation, it will be advisable to pass the finger once or twice into the rectum as a precaution against wounding the gut, and also for the purpose of guiding the catheter. After the operation is finished, a gum-elastic catheter large enough to fill the canal should be introduced and tied in: and, with this exception, the patient should be treated as if he had undergone lithotomy.

CHAPTER X.

EXTERNAL SECTION OF STRICTURE ON A CONDUCTOR PREVIOUSLY PASSED INTO THE BLADDER.

THE proceeding which has hitherto been considered under the term of perineal section is only practised in cases where the stricture is impassable to an instrument, and is, as we have remarked, effected without any guide further than that which is afforded by the point of a catheter or sound: but there is another form of perineal section which has of late been much practised and talked about. This proceeding essentially consists in the division of the contracted portion of the urethra upon an instrument first passed through the stricture into the bladder, so as to form a guide for the surgeon's knife. Thus does the operation differ materially from that which has been spoken of in the last chapter.

Mr. Syme.

To Professor Syme, of Edinburgh, does the credit belong of having brought prominently before the profession this proceeding for the treatment of certain forms of stricture. There can be no doubt of this whatever, although some consider that Mr. Syme possesses no claim to originality in this matter. There can be no question, as I will show, that the operation of dividing the constricted portion of the urethra upon a sound or catheter first passed through the stricture was known and practised by the French surgeons of the last century. We have only to look into the works of Dessault,

edited by Bichât, and there we shall find evidence of this at page 330, vol. 3rd, of the *Œuvres Chirurgicales.* The proceedings under the name of *boutonnière* are spoken of, and it is in reference to this that the following words are employed :—" On ne suit pas toujours le même procédé en pratiquant la boutonnière sur le canal de l'urètre. *Lorsque l'on peut introduire un cathéter dans la vessie,* on se sert de cet instrument pour faire sur sa cannelure l'incision du canal, et conduire un gorgeret qui doit servir à faciliter l'introduction de la canule destinée à rester dans la vessie."

Operation known to the older French surgeons.

Dessault.

Now, from this passage it is clear that the division of the urethra from without upon a conductor is *not* a new idea; but, at the same time, it must be confessed that the object to be obtained by the French surgeons was not precisely that sought for by the eminent surgeon of Edinburgh ; for, further on, we see what the French author says in reference to it :—" Ici l'opération ne présente pas plus de difficulté ni plus de danger que l'incision pour la taille au grand appareil ; mais aussi elle n'offre aucun avantage dans le traitement des rétentions d'urine ; car puisque l'on a pu introduire un cathéter, il eût été également possible de passer une sonde qui eût servi à l'évacuation des urines, et rétabli, par son séjour, la liberté du canal."

Difference in French and English view.

Now, it is clear that the question here is as to the treatment of retention of urine, and not as to the cure of a certain form of stricture *alone ;* although it must be understood that the operation *did* remove the retention and did destroy the stricture at the same time. We shall see that Mr. Syme intended his operation, not for

retention of urine, but for the *cure* of a particular form of stricture; and for this purpose I will quote his words from the original edition of his work:—"Although the distinction between spasmodic and organic strictures—or, in other words, between the semblance and reality of contraction—has been long established in surgical pathology, the latter of these conditions was not supposed to vary except in degree and situation. The treatment, therefore, did not seem to require any diversity of procedure; and in this country most practitioners preferring the plan of dilatation by bougies, employed it on all occasions. But, however efficiently strictures of the urethra might in general be thus treated, no surgeon could employ the treatment to any considerable extent without encountering embarrassing cases that presented more than usual difficulty, or even baffled every effort to accomplish recovery. I do not here allude so much to the mere tightness of contraction, and the difficulty consequently experienced in passing a small instrument through the stricture, as to the unyielding disposition manifested by the constricted canal, and its tendency to contract, perhaps even more closely than before, after being partially or completely dilated. One other feature of such obstinate cases of great importance to notice is, the strong and general sympathy of the system with every change taking place in the local disease; whence rigors and febrile attacks, leading to various derangements in different parts of the body more or less intimately connected with the part originally affected, are apt to result from attempts even of the most gentle kind to pass instruments into

Mr. Syme's description.

the bladder. Some constitutional disturbance, as that which occasions arthritic symptoms, would sometimes appear to be the cause of this particular state of stricture; and a local irritation, such as that of urinary concretions, is certainly adequate to produce the same effect, since all the features of excessive obstinacy and irritability are occasionally presented by stricture in patients suffering from stone, and disappear at once so soon as it is removed. But, independently of the one or other of these influences, the peculiar condition of stricture to which I wish to direct attention may exist in its most perfect form, and is then found to constitute one of the most vexatious subjects of treatment, so long as it is combated by the means in ordinary use. The patient, in vain expectation of relief, is apt to require in succession the assistance of many practitioners, each of whom, supposing that the previous want of success has depended upon deficiency of skill or care, proceeds to a repetition of the dilating process, destined to afford only a similar disappointment, or the more serious consequences already mentioned as not unusual under such circumstances. The following case led me to adopt the mode of treatment which I am now desirous of recommending, and will probably prove more impressive if allowed to stand alone, than if associated with other instances of the operation. I have repeatedly performed it with perfect success, and never with any unpleasant consequences; so that, instead of dreading, as formerly, to meet with the form of stricture in question, I now undertake its charge with confidence of a satisfactory issue; and while doing so, reflect with much regret upon the suffering that it would have been

in my power to relieve if this plan of treatment had occurred to me at an earlier period."*

Mr. Syme then proceeds to mention a case of stricture in which he divided the contracted canal upon a grooved staff, and where the operation was attended with the best results; and many other instances of a like nature are recorded. The following is his method of performing the operation :—"A grooved director slightly curved, and small enough to pass readily through the stricture, is next introduced, and confided to one of the assistants. The surgeon, sitting or kneeling on one knee, now makes an incision in the middle line of the perineum or penis, wherever the stricture is seated. It should be about an inch or an inch and a half in length, and extend through the integuments, together with the subjacent textures exterior to the urethra. The operator then taking the handle of the director in his left, and the knife (which should be a small straight bistoury) in his right hand, feels with his fore-finger guarding the blade for the director, and pushes the point into the groove behind, or on the bladder side of the stricture; runs the knife forward so as to divide the whole of the thickened texture at the contracted part of the canal, and withdraws the director. Finally, a No. 7 or 8 silver catheter is introduced into the bladder, and retained by a suitable arrangement of tapes, with a plug to prevent trouble from the discharge of urine."†

Mr. Syme thus recommends the operation in that form of stricture where there is a strong tendency to re-contract after the use of bougies, that which he terms

* Syme *On Stricture of the Urethra*, 1st edition, p. 11.

† Op. cit., p. 41.

the *resilient* stricture. He does not believe in the *impermeability* of any stricture, and considers that an instrument may be passed with care in every case; and he has asserted, "that division of a stricture by external incision is sufficient for the complete remedy of the disease in its most inveterate and obstinate form."*

Now, I shall not enter further into the question as to the amount of merit which is due to Mr. Syme for originality in adopting this practice, but shall leave this subject, and inquire how far my own observation has led me to trust in the efficacy of this measure in curing stricture. Much angry contention has arisen in reference to this plan of treatment: into this it is not my purpose to enter—but having had several opportunities of witnessing this plan of treatment, I shall truthfully record the results of these observations, and shall draw my conclusions from the cases which will be mentioned.

I shall speak of these cases under the head of perineal section, where an instrument can be passed through a stricture, as differing from the procedure in cases where the stricture is *impassible* to an instrument. It will be seen that in the following cases the manipulative process was not in every instance exactly carried out as recommended by Mr. Syme; although the main point was attended to—the stricture was divided upon an instrument previously passed through it.

Several of such cases have fallen under my own individual observation; and I have been able to watch the greater number of them, and notice the results. These cases, however, differed as to their nature, and as to the effects which followed the operations.

* Op. cit., p. 58.

The following is a short abstract of the *first* case. It will, I think, be found to illustrate one or two very important points connected with this measure.

Mr. B——, aged fifty, an officer in the navy, came under my observation in December, 1848, suffering most severely from stricture. It appeared that for many years he had had this complaint, and that during his service abroad he had been a good deal embarrassed by the symptoms. Five years since, whilst abroad, he was attacked with periodical rigors, which were thought to be aguish. Two years after this, he had extravasation of urine, and nearly died, but was rescued by the late Mr. Liston, who cut into his perineum, and let out a quantity of matter. After this he rallied, but the difficulty in passing water continued: from time to time catheters were passed by various surgeons, but without benefit; their use was attended by severe pain, and followed by rigors. When he first came under my observation, his symptoms were very severe; he looked quite an old man, being worn down by suffering: he had rigors every day. An instrument of moderate size could be introduced through the stricture, but dilatation could not be carried on, in consequence of the excessive pain, the rigors, and the disposition to contraction after the instrument was withdrawn. Recourse was had to caustic, and then a catheter was passed under chloroform and retained; but these measures completely failed. It now became a matter of very serious importance to do something to effect a remedy, and it was proposed that the stricture should be divided. The stricture was situated at the bulb; and on the day of Case I.

the operation, as large an instrument could be passed into the bladder as No. 7. The operation was done by Mr. Fergusson, December 11th, the contracted portion of the canal was freely divided, and a large instrument was placed in the bladder and retained there. The patient made a rapid recovery: from the day of the operation he did not have any shivering attacks. He left London in a month to join his ship, being able to pass a full-sized catheter for himself.

I had seen this gentleman on more than one occasion since the operation was performed; and in September, 1851, three years after it, he came to town to have surgical advice, as he found that all his former bad symptoms were returning. He placed himself under my care, in the absence of Mr. Fergusson; and on examination, I found that the urethra had become so contracted that I could only just pass a No. 3 bougie. This produced excessive pain. The shivering fits had begun to return, and he passed his water with great difficulty. He told me that he had continued to pass a catheter for himself occasionally for the first year after the operation, but that he afterwards got tired of doing so, and that latterly he had entirely neglected this precaution. I dilated the urethra for this patient, and sent him back to his ship in good condition.

Case II. Mr. B——, a mercantile gentleman, aged thirty-eight, came under my observation as a patient of Mr. Fergusson's in March, 1850, with bad stricture. He had suffered severely for fifteen years. He had been under the care of some of the most eminent surgeons in London, but had not obtained relief. He suffered

terribly from spasms of the urethra. The obstruction was situated at the bulb. At this time an instrument of considerable size could be passed; but then its use was followed by intense pain and spasm, so that on the next occasion it was only possible to pass a catheter of much smaller size. He was in the habit of walking about with a catheter tied in his urethra; but as soon as he had withdrawn it, he experienced great difficulty in making water, and it was impossible to pass the same instrument again until one of a smaller size had been introduced and worn for some time. The patient was subject to shivering fits, and was altogether in a very sad state. Various attempts were now made to dilate the canal; but there was so much spasm, and such a dispotion to contraction, that it was useless to go on with the employment of catheters: it was proposed that a division of the urethra should be made.

March 11th.—The patient was placed under chloroform, and a small grooved staff was passed into the bladder and retained there; and a free division was made through the contracted part, by running the knife from before backwards: a large catheter was introduced and tied in. A very smart attack of hemorrhage occurred on the evening of the day of operation. After this the patient went on well. On the 20th, a No. 8 catheter was passed; and a No. 10 was used occasionally, until the 6th of April, when the patient left town with the wound in the perineum all but closed. Soon after the opening healed entirely, and he could pass his water in a full stream without any annoyance.

This gentleman was relieved by the operation for only a short time. Before six months, his symptoms

returned; the wound in the perineum re-opened; and after trying further surgical advice, he went to Paris, to try to get cured there: but he again returned to England, and I afterwards heard that he went to Australia, not having gained much benefit from the perineal section.

Remarks on these cases.

These two cases are especially interesting, as bearing on the merits of this kind of operation. They were both instances of that troublesome form of stricture, attended with the disposition to contraction and the general constitutional sympathy referred to by Mr. Syme; and, indeed, I have not seen any cases in which the operation was more justifiable and suitable. An hypercritical person might say that the operation *failed* in both cases, but an impartial observer will see that this judgment would not be fair; for in both cases the remedial measure employed was followed by the most marked relief to every symptom; in fact, they were all removed. In the first case, a cure was to all appearance made, and this happy state of things lasted so long as the patient took the precaution of passing a bougie now and then; but upon his omitting this, his malady gradually returned, and his sufferings became similar to what obtained before. Nevertheless, a timeous recourse to dilatation put him right again, and this gentleman remained in capital health for some time, to my knowledge. Still, a most striking fact is shown by this case: this is, that the external division of a stricture cannot be considered or depended upon as an *effectual* remedy by itself, and that, sooner or later, the disease will return, unless the precaution is taken to keep up occasional dilatation.

In the *second* case, temporary relief, and that too of a striking character, was experienced after the operation; but as time elapsed the symptoms returned; and the fact of the wound in the perineum re-opening showed that the morbid condition had not been removed. Still, I must add, that the habits of this patient were unfavourable to recovery; for he drank freely, and committed other excesses.

The next case I shall detail is one where there was stricture and fistula. The operation was performed here, and with what results will be presently seen.

Case III.

An elderly man, of the name of Abrams, was admitted into King's College Hospital, under Mr. Fergusson, in the autumn of 1851, with stricture and perineal fistula. He had only had symptoms of stricture for about one year. Soon after he felt them, he went to a surgeon, who passed a catheter, but used violence: bleeding ensued, and in six weeks' time an abscess formed in the perineum. This was opened, but the wound did not heal. He then applied to another surgeon, who attempted to dilate the urethra fully, and thus cure the fistula—but vainly.

On admission, there was a large fistulous aperture in the perineum—also considerable induration along the urethra. A great deal of the urine came away by this opening. There was a stricture at the bend of the canal: it was very irritable, but it would suffer a No. 7 catheter to pass through it. The urinary organs altogether were much out of order. The patient was obliged to get up many times in the night to pass water. The urine itself was thick, alkaline, and loaded

with mucus and pus. The general health was much shaken.

It was determined upon to endeavour to cure the fistula by fully dilating the urethra; and numerous attempts were made, but there was not any progress, in consequence of the exceeding irritability of the parts: consequently, Mr. Fergusson proposed to do Mr. Syme's operation.

October 18th.—Chloroform being administered, the patient was placed as for lithotomy; and a grooved staff was passed into the bladder, and held there. An incision was then made down upon it through the middle line of the perineum, and through the centre of the fistula: this incision included the contracted portion of the urethra, which was divided from behind forwards. A large gum-elastic catheter was introduced, and tied in.

22nd.—Patient doing well. No fever; no irritation. Catheter extracted, and another introduced. Wound looking well, and healing.

29th.—This man has had great relief as yet from the operation. The catheter has been taken out. The wound is contracting, and the water is passed now by the urethra in a full stream: it contains much mucus, and some buchu is accordingly ordered.

November 12th.—Since last report, the symptoms of disease have gradually returned. The bladder has again become very irritable, causing the patient to rise every hour or two in the night; the urine is much loaded, and very alkaline. Ordered nitric acid and tinct. opium.

December 5th.—The patient is in as bad a state as

before operation. There is excessive irritability of the bladder; the opening in the perineum remains, and the urine flows through it. He is to have the bladder washed out with warm water, and to take a mixture containing nitric acid and cascarilla.

From this date the patient continued very ill, suffering at times very severely. He took most of the remedies useful in cases of irritable bladder, but only with partial relief; and as his health was giving way still further, and the wound in the perineum remained open, he left the hospital, in January, in as bad a plight as when he entered.

Remarks on this case.

Now, in this instance, it cannot be doubted that the perineal section entirely failed in effecting the object sought. It is true that, for the first week or two, it appeared as though the operation would be ultimately successful, for the symptoms were relieved to a remarkable degree. But this amelioration was of short duration; the malady returned with its former violence, and in the end the patient went away as bad as ever.

The operation in this instance was done exactly as recommended by Mr. Syme; but I do not think that this was at all a fair case for testing its value. The symptoms under which the patient laboured depended, in my opinion, more upon the diseased state of the bladder than upon the stricture in the urethra, which was by no means a tight one: and whilst the bladder is in a diseased condition, it is not reasonable to expect that any operative proceeding could remedy a morbid state of the urethral canal, or produce closure of a urinary fistula.

The following case was under my observation just after Mr. Syme's book was published, and it made a great impression upon my mind:—

Case IV. John Battershall, aged thirty, a fine young man, came into King's College Hospital, under Mr. Fergusson, in the early part of 1849, with stricture, from which he had been suffering, more or less, for twelve years. When admitted, he was suffering from a great deal of pain about the region of the bladder and in the loins: he also had great pain whenever he passed his water. There was a stricture at the bulb: it was not tight, but it was very irritable, and a No. 5 catheter could be introduced through it. Attempts were made to dilate the urethra fully, but very great difficulty was experienced; for the introduction of catheters was followed by great pain, and no one larger than No. 5 could be passed. Caustic was tried also; and an instrument was passed under chloroform, and was retained for some days: but these measures did little or no good, and the patient left the hospital.

In the month of December, he again applied in the same condition. There was great irritability of the canal, and a disposition in the stricture to contract as before: consequently, it was proposed that he should undergo the operation of perineal section. On December 15th, the patient was placed under chloroform; a grooved staff was passed *through* the stricture, and an incision was made down upon it through the centre of the perineum, and the stricture was divided from before backwards. A large gum-elastic catheter was passed into the bladder. There was not any difficulty

in the proceeding, nor was there any unusual amount of bleeding.

In the night after the operation there was some smartish bleeding, which, however, was speedily checked. For the next five or six days the patient progressed favourably, but at the end of the week an unfavourable turn took place. He became feverish and depressed; vomited occasionally. These symptoms gradually got worse, and he sank within a fortnight of the operation.

On post-mortem examination, there was not anything discovered to account for the death of the patient. The stricture had been fairly divided, the incision having gone right through the bulb. There was not any disease of the bladder, any extravasation of urine, or any appearance of phlebitis; and the organs of the body were healthy.

Remarks on this case.

Now, in this instance there cannot be any doubt that the patient died from the operation. The mode of his dying, and the symptoms attending it, were very similar to what obtained in the case of the young man who died after the old operation of perineal section had been performed upon him. There did not appear to be any reason why either patient should die; for in neither was there any large quantity of blood lost, and each person rallied well from the immediate effects of the operation.

It might have been supposed, from the symptoms coming on a few days after the operation in this case, that the patient might have had phlebitis: but there were not any evidences of this state after death; and it

will be seen, by another case which I shall presently detail, that the evidences of phlebitis are well marked during life, and difficult to be mistaken. We must conclude that this poor young man fell a victim entirely to the surgeon's knife, that his general system too easily sympathized with the local injury, and that the disturbance caused by the interference with his urethra was too great for him to bear. Why this should be the case in one, and not in another, it is difficult to say. The patient was, comparatively, in good bodily health; but certainly, the symptoms his malady presented indicated that he was a very irritable subject: for his urethra was always very irritable, and the dilating process could not be carried beyond a certain extent. It was just one of those cases in which the operation recommended by Mr. Syme might be expected to succeed; and in all probability, if life had been saved, it would have been attended with the same temporary benefit as Mr. B——, the naval officer, experienced: for although the symptoms were not so severe in this last instance, there was the same morbid irritability of the urethra and the disposition to contraction as was so well marked in that interesting case.

Having spoken of *phlebitis* as a cause of death after this operation, I shall detail a case in which a fatal result was produced by this accident. Although I take the particulars from the *Lancet* of June 19th, 1852, I do not depart from my original plan of relating only cases which have fallen under my own observation; for, through the courtesy of Mr. Coulson, I had the opportunity of seeing this patient, both on the operating

table and when he was labouring under the fatal symptoms.

"R. S——, ætat. thirty-four, admitted, April 16th, into St. Mary's Hospital. Eight years previously, he had been struck with a bar of iron on the perineum, and soon after had painful micturition, with diminished stream. Stream has gradually diminished in size up to present time, and he describes his water as coming out like steam from a boiler. Sometimes he is obliged to make water often—at others not. For the last three months he has had bougies armed with nitrate of silver passed down to the stricture, but no instrument has been got into the bladder. Case V.

"April 21st.—Syme's smallest staff was passed into the bladder, and the stricture divided on it through the perineum. No. 6 silver catheter was then passed into the bladder, and retained.

"22nd.—Feels pretty comfortable. Some urine flows through the wound, as well as the catheter. In the evening the patient had several rigors, with great thirst and quick pulse, and pain in the urethra. From this date the patient had all the symptoms of purulent infection, and died on the 2nd of May."

On post-mortem examination, pus was found in the various organs. Purulent pericarditis to a great extent was observed. "The bladder was capacious; its coats were thickened, and its mucous membrane posteriorly somewhat congested. The prostate exhibited some rough depressions on either side; the veru montanum was prominent. The membranous part of the urethra was in a state of induration from long-continued inflam-

mation. The perineal incision was in the middle of the canal, and had divided the bulbous portion of the urethra, and ceased just at the anterior extremity of the membranous. The whole tract of the urethra, from the prostate to the glans penis, presented an inflamed and congested mucous membrane, under which the submucous tissue abounded in small, round, purulent deposits, which were scattered plentifully, like yellow seeds, from one end of the canal to the other."

Remarks on this case.

Here is another instance of death after the operation, the immediate cause being that which might obtain after any cutting operation; and it is not a matter of any surprise that phlebitis should occur after a proceeding where so vascular a tissue as that of the urethra has been cut into, and a large surface is left exposed which is being continually liable to irritation and inflammation from the urine coming in contact with it. Thus, it would not be surprising if phlebitis were to occur frequently after the perineal section.

Discussion in reference to this operation.

Since the introduction of the operation by Mr. Syme, there has been so much discussion among various members of the profession upon the merits of this proceeding, that the question as to whether the operation is either justifiable or beneficial is by no means settled, and it is not easy to come to any correct conclusion relative to the real merits of this means of treating stricture, because the parties who have discussed it have shown too much personal feeling, each one denying the statements of the other, and thus almost entirely leaving the profession in the dark. This should not be so; especially as the question is a most important one, as

affecting the safety and comfort of many individuals who suffer under the most severe forms of stricture, and as the remedial measure itself has been so strongly recommended by a surgeon of great repute.

It becomes, then, a matter both of necessity and propriety to endeavour to find out the real merits of this so-called perineal section; and this object will be best gained by stating truthfully the results of one's own observation, not withholding anything or adding anything. It is my earnest endeavour to do so; and I shall now just enter upon the objections which are urged against it.

Some of those surgeons who have entered into the controversy say that it is not necessary to divide a stricture through the perineum, if an instrument, however small, can be introduced previously.

Objections against the operation.

In the second place, they maintain that this external division of the urethra is not attended with *permanent* good result, that the canal contracts again after a time, and that not unfrequently the wound made during the operation in the perineum either remains patent or re-opens; and thus the subjects of the operation are left in a condition worse than they were in before.

Their *third* and most grave objection is, that the perineal section is likely to be followed by *fatal results*. Thus, to sum up the whole of the main objections, the operation is deemed *unnecessary*, *inefficient*, and *dangerous*.

I shall at present lay aside the question as to the actual necessity of the measure, and at once proceed to the consideration of its *utility* or *expediency*.

Objections inquired into.

The first case related—viz., that of Mr. B——, the

naval officer—bears much upon this point. It shows that the free division of the strictured portion of the urethra from the outside, in a case of contractile and irritable stricture, may have the most beneficial effect. In this case, the patient had been living a life of misery, and had been unable to get even temporary relief by dilatation; his sufferings were just those described by Mr. Syme, and if ever there was an undilatable stricture this was one.

The relief from the operation was speedy and decided; the patient was restored to health, his life was placed in safety and comfort. His surgeon wisely advised him to take the precaution of passing a bougie occasionally. Consequently, so long as he followed this advice, the good effect of the measure persisted; but when he omitted the casual introduction of bougies, the malady returned *paulatim et gradatim;* and at the expiration of three years from the operation, the patient was in some respects nearly as bad as before.

This case, then, shows what some of the instances in Mr. Syme's work prove, that by this operation a patient who has been long and most intensely suffering with inveterate stricture may be speedily and entirely relieved for a time; and, indeed, so long as the individual takes the precaution to pass a bougie now and then, he may consider himself free from disease. On the other hand, this case, which is not at all overdrawn, shows that the measure of dividing a stricture externally cannot be depended upon as "an effectual" cure, as Mr. Syme asserted it to be.

Case. I have lately seen a gentleman two or three times, whose case is much to the point. It is that of another

patient of Mr. Fergusson, who had suffered for some time from stricture, accompanied by a profuse discharge of matter from the urethra. Various methods of treatment were perseveringly employed for some length of time, but the affection could not be cured. This patient, who had come from the West Indies, and had re-crossed the Atlantic not cured, returned in the spring of 1854. Mr. Fergusson then determined to lay the urethra freely open. This operation was performed in April, a grooved staff being first introduced into the bladder. The case was a long time in hand: the wound, which at the termination of two months had healed up, broke open again, and the health continued much shaken, until he went to the Channel Islands, where a great change for the better occurred; the wound in the perineum closed, and in September I passed a No. 8 or 9 catheter for him. He was enabled to get married, and left this country quite well.

In September of the last year, during Mr. Fergusson's absence, this gentleman called upon me; and I found that the stricture had returned, and that he had been under the hands of Mr. Fergusson, who had passed instruments on many occasions during the summer.

I have, however, lately seen a case which proves more impressively than the one just quoted, that the operation of external section upon a grooved staff is not to be depended upon as a cure, and that a return of the disease and all its sad symptoms may be looked for even within a brief period.

There is at present (January, 1857) lying in King's College Hospital a man of the name of John Thomp-

son, aged thirty-four, in as bad a condition as can well be conceived. His penis is greatly swollen and hypertrophied; his scrotum and perineum are converted into an indurated mass, through which the urine and pus dribble away from various openings, and the patient himself is in a very reduced state of health. On examination by the catheter, a hard and impenetrable stricture is found at the bulb.

Now, I was present when Mr. Fergusson performed on this patient the operation of external section, on February 3rd, 1855, for a somewhat similar state of things. The proceeding was carried out in this very case with remarkable care; the incision of the strictured part of the urethra being effected upon a small grooved staff previously introduced through the contraction. On referring to my notes, I find that the patient did remarkably well afterwards, and left the hospital, at the end of April, "in very fair health, but the sinus in the perineum not quite healed." On questioning the patient, he assures me that the opening did heal, and remained sound for nine months, when it re-opened, and occasionally discharged matter; that in August last he caught a severe cold, and that the discharge of matter very much increased, and notwithstanding the efforts of his medical attendant to introduce an instrument, he did not succeed; and he has gradually become worse, until he has got into the wretched condition above described, and which the numerous students who attend Mr. Fergusson's class will say is not at all exaggerated by me.

Operation not a permanent cure.

However clearly this case alone proves the truth of the objection that the operation is not followed by

lasting benefit, it ought by no means, in my humble judgment, to follow that the proceeding should be rejected on that score only: for what mode of treatment is there which is sufficient to *cure* permanently a real organic stricture, and which will not be followed by re-contraction of the once-diseased part if occasional dilatation is not resorted to? The surgeon must not fall into the error of supposing that external incision, as recommended by Mr. Syme, will produce an effectual cure, as he would be led to expect by the perusal of the cases which are related in his original book "On Stricture and Perineal Fistula."

This *alone* not an objection.

Even if there was not any actual proof of the fact that a return of the stricture would ensue if the precaution is not taken to pass an instrument occasionally, there would be every reason to suppose, from what we know, that it would occur; because, after a wound has been made in the substance of the urethral wall, whether by a sharp or blunt instrument, a certain amount of material is thrown out for the repair of the solution of continuity, and thus the calibre of the canal must necessarily be encroached upon to a greater or lesser extent.

Fistula remaining after operation.

The next objection to the operation as a useful one, and the one which is the most serious, is that the opening which has been made in the perineum does not in some instances close up; or that, if it does heal, it is liable to break open again; and that thus the patient becomes placed in a worse condition than he was in before—especially, too, if he did not have any fistula previously. Now, this circumstance did occur in the case of Mr. B——, the second related; and in the case

A serious objection.

of *Abrams*, the fistulous aperture which was in existence before the operation would not close, even after it had been freely opened up; the relief gained was of very short duration, and it may be affirmed that the operation did not do any good for this patient; but I strongly suspect that there was considerable disease of the bladder in this case, and that it was not by any means a fair case for testing the operation.

In order to prove further that fistula may remain open after this operation has been performed, I shall detail a case which fell under my own observation, and where Mr. Syme himself had previously performed the operation. On this account alone will it be more interesting.

Case VI. George Hill, aged forty-nine, an unhealthy-looking man, came under my observation in May, 1849. He was at that time suffering most severely from stricture and its results. There was a large fistulous opening in the perineum, through which the urine passed freely; there was great irritability of the bladder, and general constitutional disturbance. There was a hard, cartilaginous stricture at the bulb, through which it was only possible after more than one attempt to pass a No. 4 silver catheter. He stated that he had suffered with stricture for fifteen years, and that he had the greatest pain and difficulty in making water. After having undergone a great deal of treatment, he presented himself in the spring of 1848 at University College Hospital, and was admitted under the care of Mr. Syme. This surgeon employed dilatation for some weeks; but his urethra was so excessively irritable, that he was obliged to desist for a time, and then

re-commence the treatment. But, as the plan did not succeed, Mr. Syme laid open the urethra through the perineum, and soon after left London, when the late Mr. Morton took charge of the patient, who afterwards discharged himself.

He was able after this to pass a gum-elastic catheter for himself; but not long before he came under my observation, he failed in his attempts, and his symptoms returned as before—abscess formed in the perineum, and this terminated in fistula.

June 23rd.—The perineal section was performed upon this man, and the stricture, which was of a cartilaginous hardness, was divided fully, and an elastic catheter was retained in the bladder. This patient was relieved by the operation for a few days; but a change took place for the worse: the bladder and urethra became very irritable; the catheter could not be kept in, because its cavity became blocked up by mucus and pus; the man got weaker, and gradually sunk on July 11th, eighteen days after the operation.

On a post-mortem examination, the main feature observable was chronic inflammation of the mucous membrane of the bladder: there was a great deal of pus in its cavity.

Remarks on this case.

In this case also it is very probable that chronic disease of the bladder had existed for some time, in consequence of the long persistence of a very severe stricture; and, most likely, the non-success of either operation was due to this circumstance. I shall not dwell further upon this point, but I may as well state that there is good reason to believe that in other cases where this operation has been done, the openings in

the perineum have not closed, or have recurred after having been healed. To those who are curious on this subject, I would refer to the work of Mr. Lizars on Stricture, published in 1851.

It behoves me to inquire into the truth of the objection, that it may be attended with fatal results. Indeed, by the relation of three cases, I have already shown that this serious objection to the operation of perineal section is a valid one.

Death caused by the operation. A valid objection to it.

In neither of these cases was death caused by any error in the operative proceedings; and in the first there appeared to be no cause whatever for the dissolution of the patient beyond the mere shock which was produced by the operation, as there was no great difficulty in the proceeding itself. There was no sign during life of any inflammation within the pelvis, and after death there was not any satisfactory solution of the matter. Death, in fact, seemed due to the injury which the surgeon had inflicted by his knife: the system was too irritable for the tolerance of such interference. It will be observed that the circumstances attending this young man's death were very similar to those which were observable in the instance before related, where a healthy man died a few days after the old operation had been performed, the symptoms in each being those of shock and irritation, but not of inflammation. It is not however, a matter of surprise that a patient should die from the mere shock of the operation for opening the urethra in the perineum, when we take into consideration the intense amount of irritation which is produced by the attempted introduction of a catheter into the bladder in some cases, and when we bear in mind

that death has actually occurred from this mild operation.

In the *second* fatal case, also in a man apparently healthy (excepting his stricture), death was produced by a cause which may to a certain extent be deemed accidental: but still, at the same time, the phlebitis had arisen directly through the injury which had been inflicted by the knife of the surgeon. It is not surprising that phlebitis should occur more particularly after this operation; for the part cut into is excessively vascular, and there are numerous veins about the neck of the bladder. I believe that the same cause of death obtained in a case operated upon by one of the surgeons to Guy's Hospital. And in the case of the man Andrew Cree, who was operated upon by the late Dr. Mackenzie, of Edinburgh, on December 31st, 1850, death took place on the eighth day; and on post-mortem examination, "phlebitis and purulent deposit in the chest" was discovered, although there was no inflammation of the veins about the bladder.

Hemorrhage.

I come now to a matter of very great importance in connexion with the *dangers* of this operation—viz., *hemorrhage*. There has been much angry, and apparently useless, discussion upon this point, as the opponents of this procedure have stated, not without grounds, that hemorrhage to an alarming and even fatal extent may follow it; and some assert that it is impossible to divide the spongy portion or bulb of the urethra without producing considerable bleeding. A mere look at the bulbous portion of an injected urethra will satisfy the mind of the most sceptical that it is impossible to cut

through the bulb without producing more or less bleeding; but I believe that the degree of hemorrhage will depend much upon the nature of the stricture operated upon. It seems, *à priori*, somewhat remarkable that it has never occurred to me to witness any uncomfortable amount of bleeding during or after the operation of cutting down upon the point of the catheter, and I must have witnessed nearly *twenty* cases in which it was done; whilst, on the contrary, I have known hemorrhage take place to an alarming and great extent on more than one occasion after Mr. Syme's operation. I think it may be accounted for in this way:—In most of the cases where the old operation was effected, the disease was of very long standing: the urethra had become converted into a hard and callous cord, as it were; the parts around the canal were in a great state of disease, the tissues being infiltrated, thickened, and indurated. In this change of texture the blood-vessels themselves must have participated: many of them, and especially the larger ones, had probably become partially blocked up, and thus, when divided, they did not pour out much blood. And moreover, I have noticed, when the incisions are made through the indurated tissues of the perineum, that at first the divided vessels bleed freely, but that they in a short time cease throwing out blood.

But, on the other hand, in cases where the operation last spoken of was performed, it has generally been in cases where there has merely been an irritable and contractile stricture, and not any complication of disease around the urethra: consequently, the vessels have been less changed, and when cut poured out much more blood.

This explanation may not be a correct one: still, I offer it to account for that which, according to my observation, actually has occurred, and which circumstance may appear to some to be very difficult of solution.

In support of this, I must state that hemorrhage has occurred to a greater or less extent in more than one case in which the new operation of perineal section was performed: but I shall content myself with detailing a case which will convince the most ardent advocate of this operation that hemorrhage is a thing of formidable reality.

Late in the evening of November 6th, 1851, I was hastily summoned to a gentleman, aged twenty-five, living in London. On getting to his bedside, I found him apparently at the point of death. His face was pale as the sheet which covered him; he was tossing about from one side of the bed to the other, and he was continually sighing: his pulse was 140, and thread-like. On examination, I discovered that he had lost an enormous quantity of blood from the urethra, and that bleeding was still going on to an alarming extent into the bladder, as was shown by the large quantities of clotted blood which came away by a wound in the perineum. I ascertained that this gentleman, who when in health was a fine, hearty fellow, had suffered for some years with stricture,—that latterly it had become very irritable, and difficult to treat. His surgeon was enabled to pass a No. 7 catheter, but not being able to make much progress by dilatation, he proposed to his patient that he should submit to Mr. Syme's operation: consequently, this proceeding Case VII.

was adopted on the 23rd of October, exactly one fortnight before I was called to him. On the 28th, some bleeding took place from the wound, and it was found necessary to introduce a catheter, which apparently checked the hemorrhage. However, on November 3rd it appeared again externally, and continued, more or less unabated, until the morning of the 6th, when it increased in violence, could not be checked, and brought the patient into the dangerous state in which I found him.

When I first saw this patient, I thought that he could not outlive the night: however, I did not leave him. He had taken such immense quantities of brandy, that he was almost stupified: I continued giving him small quantities during the night. Towards morning, matters became more alarming: the jactitation and sighing became much more frequent; the stomach refused to retain even a morsel of ice. Bleeding from the wound was still going on; large clots every now and then came away. In this state of things, I introduced a large lithotomy-tube through the wound in the perineum into the bladder, and retained it. I at the same time threw up the rectum small quantities of brandy and beef-tea, and repeated the injection: fortunately, the fluid was retained. The patient in a few hours began to rally. The bleeding was partially checked by the tube, which was kept in for some hours. During the following day, the patient remained in a very precarious condition; but the stimulating injections were continued; and although a great deal of clotted blood came away with the urine, showing that the bleeding was still going on, he gradually

rallied. The stomach was able to retain a little brandy, and by the next day he rallied well. The urine became less bloody. He was enabled to take some light nutriment, and at the end of a few days this gentleman was got out of the most dangerous state I ever saw a man recover from. It is my decided impression that if the stimulating injections had not been given him, he would never have rallied; for the stomach would not retain anything: indeed, so extreme was the case, that a proposal was made to resort to *transfusion of blood.*

Remarks.

I have not seen death actually occur from hemorrhage after this operation, but I think that the condition which this patient was in was next to it: and if this does not convince those who have denied that fearful hemorrhage may occur after cutting through the bulbous portion of the urethra, I know not what will. I am aware that some do not impute much danger to cutting the bulb, even in the operation for stone; but I am persuaded this is a mistake, and another case of almost fatal bleeding from this part impressed me with this.

Probability of hemorrhage.

On the 19th of March, 1851, I performed lithotomy on a boy aged seven, and in doing so cut through the bulb; but there was not much bleeding during or immediately after the operation. However, on the fourth day, a large mass of coagulated blood came away by the wound; and on the twelfth day he became very pale and depressed, and a second bleeding occurred to such an extent that the little patient very nearly died.

It is true that in lithotomy, where the incision is made in the lateral portion, there is more danger of

wounding the artery of the bulb where its calibre is larger than when an incision is made quite in the middle line, as in the operation for stricture. Still, the occurrence of this serious bleeding after wounding the bulb in cutting for stone bears somewhat upon the question of its liability to occur from perineal section. At any rate, the surgeon who chooses to perform this operation must look upon hemorrhage as one of the dangers which he and his patient may have to encounter: unless he does so, he may be most bitterly deceived.

Remarks on the merits of the operation.

After having fairly considered all the circumstances connected with this procedure, and having had repeated opportunities of watching cases where it has been adopted, it is impossible for me to come to any other conclusion than this: viz., that the operation does not always what its promoter so strenuously affirmed — "accomplish quickly, safely, and surely, what has resisted all the prolonged, complicated, and hazardous procedures which ingenuity has devised or patience endured."* Of course, I merely speak in reference to my own observation of the results of this operation: probably others can speak with much greater confidence of it. The cases detailed in this chapter show that the objections adduced by some are not without foundation; but, at the same time, it would be unfair to deny that it may be attended with most excellent results. The first case detailed at length, and the cases recorded by Mr. Syme and others, show this. Some surgeons may admit this, and yet say, What *necessity*

* Syme, op. cit., p. 10.

Inquiry as to the necessity of operation.

was there for cutting, when an instrument could be introduced? I for one do not consider that this necessity *often* exists: still, an unprejudiced surgeon, who has had opportunity of seeing this disease, must admit that cases are now and then to be met with where dilatation cannot be carried on when assisted by the most judicious application of other remedial measures, and where, from constitutional sympathy, the patients are reduced to the extreme of misery, and are consequently willing to undergo anything which may bring relief. In such this operation may be justifiable and proper. The greatest temporary relief has been given; and there is reason to believe that if those who undergo it take care to keep the urethra open by passing a bougie every now and then, they may be comfortable for life. There are some cases, moreover, to be met with, although rarely, where the effects of long-standing stricture seem to be entirely beyond the influence of ordinary treatment, and where the operation of laying the urethra freely open in the median line is a perfectly justifiable remedy, although that canal may be permeable. I more especially allude to instances where, from the effect of long-standing stricture, the perineum and scrotum have become riddled by numerous fistulæ, where it is possible to pass a large catheter, and yet no treatment seems to be of any service. If proper attempts have been continued for a length of time in vain, it is justifiable to make a free opening into the urethra, either cutting through the strictured portion, or penetrating the membranous part, if there is not much appearance of stricture.

Case.

Whilst I was paying a short visit to Brighton a few weeks ago, my friend Mr. Alfred Field asked me to see a very troublesome case of this nature, which had resisted his most careful attempts to bring about an effectual remedy. The patient, who was about sixty years old, had laboured under stricture for forty years, and Mr. Field had been treating him for six months, at the end of which period the urethra had become so much dilated that a No. 12 catheter could be passed; but the perineum and buttocks were riddled with no less than fourteen fistulous openings. There was intense irritability of the urethra, bladder, &c., so that the poor patient was constantly kept in a state of misery: moreover, he was troubled with a further annoyance in the form of a large quantity of small lithic acid calculi which were discharged from day to day. Although, when I saw him, Mr. Field was able to pass a large catheter into the bladder, there had not been any disposition in the fistulæ to close. To try and effect this, Mr. Field had been passing a full-sized catheter every day for some time, and it now became a question as to what should be done. I suggested, that if further persistence in the same plan of treatment did not improve the condition of the patient, it would be perfectly justifiable to open the urethra, so as to divert the urine from the course it now took.

A fortnight afterwards, Mr. Field, finding that the patient's sufferings were much increased, opened the urethra, and placed a canula in the wound. In a little time, he states, "the relief which at once resulted from this proceeding was most delightful to witness. At the present time (three weeks after the operation), he is

comparatively well; the sinuses are closing. His appearance is much improved: he expresses the deepest gratitude to you for your excellent suggestion." In another part of this communication, Mr. Field states that one "sinus must have communicated with the rectum before the operation, as the catheter on several occasions was blocked up with fæces."

It must be borne in mind that this operation was not, strictly speaking, so far as I can learn, the proceeding we have just been considering; for the membranous portion of the canal was opened, as I should suppose, behind the locality of the pre-existing stricture. Nevertheless, it was a modification of that measure, and may with propriety be related here.

It certainly is much to be wished that the future history of the cases published by Mr. Syme and others could be traced and made known. However, as in other matters of importance, time will assist in proving the utility and expediency of this measure; and it will in all probability be found that it is not so safe and beneficial as its admirers would have us believe, nor so entirely dangerous and useless as its violent opponents would deem it to be.

Should not be performed except as a last resource.

There cannot, however, be a doubt that this operation of perineal section, if employed at all, should only be adopted in those cases where every other remedy has failed; for it is a very serious matter to hazard the life of a patient who is in other respects in good health, and the more especially when it is found that an instrument, however small it may be, can be passed through a stricture. That surgeon cannot be sufficiently blamed, who would rashly adopt such a pro-

cedure when he knows that it has been attended with fatal and most serious results. It would be far better to trust to a patient employment of the dilating instrument—and should this fail, of caustic—than to expose a comparatively healthy man, expecting no danger, to such hazard as obtained in the instance of the patient who so nearly lost his life from hemorrhage. At all events, the surgeon is only justified in resorting to this operation when the case is otherwise intractable, and after he has fairly placed before his patient the liability he must submit to of exposing his life, or at least has stated to him that the operation is not without some danger. At the same time, he may hold out a prospect of effecting most material relief—relief, too, which will be permanent, if he will only take the precaution of resorting occasionally to the use of the bougie during his lifetime.

It may be objected by some, perhaps, that the conclusions I have arrived at are not of much value, insomuch as there is no evidence that I have myself tried this operation. I willingly admit that I have not subjected any patient of mine to this proceeding. It has fallen to my lot to have under my care cases which answer the description of those related by Mr. Syme, and which have been operated upon by him and by other surgeons; but it has appeared to me to be unnecessary to subject a patient to an operation which may destroy life, unless a very pressing emergency exists; and this, in my opinion, does not obtain—except under rare circumstances—so long as an instrument can be passed through the stricture.

The cases which have been detailed in this chapter

were most carefully watched by me, and some of them were during a period of the treatment under my own personal care. Several other such cases, showing both the beneficial and fatal effects of this operation, could be related; but I shall content myself with what I have already stated. It has been my endeavour to investigate this subject without any prejudice, and I trust I have given evidence of this frame of mind.*

* It is necessary for me to state that the staff, or conductor, which Mr. Syme uses in the operation of external section, differs from that which was at first recommended. The staff now used is larger in the stem, or straight portion, than in the curved part, which is grooved, and which alone is passed through the stricture as a guide for the knife. The object, I suppose, of using a staff of this construction is to limit the incision to the contracted part.

A much more ingenious and useful modification of the conductor is that called the catheter-staff, devised by Mr. Matthews, the surgical instrument maker, of Portugal-street, and used first by Mr. Fergusson. The upper three-fourths of the instrument is a hollow staff or catheter; the lower curved part is grooved. By employing this, the surgeon is certain that he has reached the bladder, and need not exchange it for another instrument to be used as a conductor.

CHAPTER XI.

TREATMENT OF SPASMODIC STRICTURE AND RETENTION OF URINE.

In this work, it has been my principal object to bring under notice those points connected with stricture of the urethra which have been so much open to discussion, and upon which some light may still be thrown by a careful observation and collection of facts. Thus it is that I have devoted so large a portion to certain methods of treating the disease in its organic form. But the work would be much more incomplete than it is, were I not to devote a few pages to the consideration of the treatment of that variety termed *spasmodic stricture*, and of that condition or accident which arises chiefly, in my opinion, from it.

Treatment of spasmodic stricture.

Reference has already been made, in an earlier part of this work, to the treatment which should be adopted in certain conditions which, as it were, accidentally obtain, and, forming a prominent feature, reduce the affection for a time to what may be termed a spasmodic stricture. I allude to the temporary irritability and spasm which are sometimes produced by various causes during the time that a case of organic stricture is being treated. In speaking now of spasmodic stricture and its treatment, I mean strictly

to allude to that condition where the chief element is *retention of urine.*

Two objects to be held in view.

When the surgeon is called to treat a case of spasmodic stricture, he has *two* objects in view. The first is to relieve that which is the most prominent symptom—viz., retention of urine; and the second is to prevent the recurrence of the spasm. There is some difference of opinion as to what measures should be used in a case of true spasmodic stricture, although all surgeons are agreed that the first thing to be done is to get rid of the retention, which is the main symptom and embarrassment. The bladder must be emptied in some way or other, and the question is, which is the best method to adopt—to pass an instrument at once into the bladder? or to trust to certain medicines, locally and generally applied?

Careful catheterism.

If the attack has been brought on by some accidental cause, without the co-existence of a permanent stricture, the best plan to adopt, perhaps, is at once to take a silver catheter of moderate size, well warm and oil it, and with the *utmost gentleness* pass it along the urethra until it becomes obstructed at that point where the spasm exists. It should then be gently pressed against the obstruction for a few moments; and in most cases, if previous trials have not been made, and injury has not been done to the urethra, the instrument will glide into the bladder, and the patient will be relieved at once.

Success will depend, in a great measure, upon the kind and size of the instrument which is employed. In many cases of retention, the surgeon will not be able to get any information from the patient, either in conse-

quence of intoxication or some other cause, regarding the previous condition of his urinary organs; and it will then be best to use a silver catheter as large as a No. 6 or 7; for this will be readily introduced in some cases where it is not possible to pass one either smaller or larger. It has not unfrequently happened to me to be called to cases where another surgeon has attempted to pass a gum-elastic catheter, or a small silver one, and has failed in getting into the bladder, and yet I have succeeded at once in introducing a No. 6 or 7 silver catheter with ease. One other important lesson I have learned by experience; and this is, not to be content, when called a second time to the case, with taking the same sized instrument which has been passed, perhaps, only the day before. Some little time ago, I was called, late at night, by a medical friend, to a case of retention where I was able to pass a No. 6 silver catheter. Next morning it was necessary to use an instrument, and, to my great mortification, I could not introduce the same which I had passed with ease the night before. Most fortunately, my friend had a small elastic catheter with him, and I succeeded with this. It may be readily conceived that I lost some credit, both with the patient and practitioner, until I had had two or three further opportunities of passing the catheter—fortunately without difficulty.

Should, however, the case be one in which the spasm has been added to an organic stricture from some cause of irritation, it will be better not to attempt the introduction of an instrument at once into the bladder; for in all probability it will be obstinately obstructed, and if further efforts are made—perhaps with some amount of force—

the irritation will be increased, and the urethra even may be injured, and matters be made worse. The plan in such a case, which will be found most effectual, and which is mentioned by some authors, is to get a wax bougie of small or moderate size, pass it gently along the urethra until its point comes to the obstruction. Gentle pressure should be made against the face of the stricture for half a minute or a minute. By this time the patient perhaps feels an increased desire to pass water: the bougie is then to be withdrawn somewhat suddenly, and in some cases the urine will flow. If it be possible, it is well to insert the point of the bougie within the stricture itself, and to allow it to remain in contact with it for a few moments.

Bougie passed up *against* stricture.

Mr. C—— applied to me, December 27th, 1848. He had a stricture at the orifice of the urethra, and also one at the bulb. I had a few days previously divided that at the meatus, and had passed a bougie daily, so that I was enabled to introduce a No. 4. On this day I had merely passed the bougie through the meatus. A few hours after he left me, he returned, suffering from severe retention. I immediately took a small wax bougie, passed it gently down as far as the second stricture, then inserted its point into the contraction, and left it there for a minute. On withdrawing it, the spasm gave way, and the patient passed his water.

Case I.

This plan of treating spasmodic stricture and retention is more especially applicable if we are summoned to a patient who has permanent stricture, and where forcible attempts have been made to get a catheter into the bladder, so that a great deal of irritation

has been excited, and bleeding has been produced. If further attempts are made, it will in all probability happen that the spasm will be rendered more obstinate.

Case II. General M——, aged sixty, had suffered for some time with stricture. Was brought to me, in the middle of the night, by a practitioner, September 20th, 1851. On coming down into my consulting-room, I found a table covered with a towel, and on it were arranged several catheters of various shapes and sizes: some of them were covered with blood. The patient himself was in the room, suffering with complete retention of urine. On inquiry, I ascertained from the practitioner that he had endeavoured to pass various instruments into the bladder, but had not succeeded in relieving the retention. He had organic stricture, for which he had consulted him before. I thought that it would not be advisable to make any further forcible attempt to overcome the stricture, and therefore took a gum-elastic catheter, passed it gently down the urethra until it came to the obstruction at the bulb. I pressed its point gently against it for a minute, and then withdrew it. The General immediately had the inclination to make water, and on making the endeavour, completely emptied his bladder.

Sometimes retention of urine comes on in consequence of hemorrhage into the bladder, produced by the simple operation of catheterism. An interesting case of this description fell to my care.

Case III. Mr. S——, aged twenty-one, called upon me, about four o'clock in the afternoon, for the purpose of having a catheter introduced, as he had organic stricture, and

was going for an autumnal tour. I passed a No. 8 catheter into the bladder. There was considerable resistance to the instrument; but the patient did not suffer much pain, and he went away.

On his journey towards the railway-station, three hours after, he felt a desire to pass water, and was much alarmed at finding nothing come away but a little blood. The irritation increased, and complete retention of urine occurred. He came to my residence, but I was from home; and he accordingly sought the advice of another gentleman, who passed a catheter down the urethra, but without giving any relief; and the patient was told that there was not anything in the bladder, and was ordered to take a sedative draught to allay the irritation.

This gentleman again sought me, late at night, and found me at home. He was suffering most acutely; and, on examination, I saw that his bladder was greatly distended. I at once passed a catheter, without trouble, into his bladder, and drew off an immense quantity of urine and blood.

On the following morning I was in hopes to find him able to pass his water, but the retention persisted, and again it was needful to pass a catheter, when a large quantity of bloody urine was drawn off. As it was evident that the hemorrhage was still going on, and that it must have been caused by some slight injury to the back part of the urethra, I tied the catheter in, and left it until evening, when the urine was drawn off less bloody, and the instrument was retained in the bladder. The patient suffered a great deal of irritation, and the instrument was forced out during the night. However,

it had had the desired effect; for, on my visiting him in the morning, he attempted to make water, and in doing so expelled first some long clots of blood moulded to the shape of the urethra, and then his urine in a pretty fair stream. From this time the retention ceased, but the patient was much blanched by the bleeding. Since this attack, I have passed the catheter for this patient several times, and have had much more difficulty than I experienced on that occasion; but he has never had retention of urine from the occurrence of hemorrhage.

I suppose some slight laceration must have taken place in my attempt to pass the catheter, and thus have caused the bleeding; that the blood coagulated in the back part of the urethra, and thus mechanically closed the canal. It is a curious case, and I have never seen one like it: it is more like what one sees not unfrequently after lithotomy, when the blood has flowed into the bladder and coagulated.

Retention of urine will be occasioned by stone in the urethra sticking behind a stricture, thus irritating the canal and producing spasm, or assisting to close completely the already contracted urethra; or a calculus may produce retention when there is not any stricture, merely from the mechanical effect.

Two instances of retention of urine from this cause happened to fall under my notice within a few weeks of one another. The first case is much to the point.

Case IV. I was hastily summoned, in the evening of July 8th, 1854, to see an elderly gentleman who was under the care of Mr. Fergusson. I found the patient in a state of collapse and remarkably urgent suffering from retention of urine. His bladder was enormously distended.

It appeared that, three days previously, he had visited Mr. Fergusson, who had passed a catheter into his bladder. On the following day there was an exposure to cold, and subsequent difficulty of micturition. This increased; and for near forty-eight hours before I was summoned, the patient had been suffering most acutely, and an abscess had burst in the perineum.

On attempting to relieve this patient, I found a contraction at the meatus, a second about four inches beyond, and the point of the instrument was stopped at the bulb. I used a No. 4 silver catheter with an ordinary curve; and during the necessary and somewhat prolonged manipulations, I experienced a sensation which I never before felt while using instruments: it was a grating sensation, as though the corpus spongiosum had been infiltrated and hardened. Finding thus that there was something peculiar, and that I could not relieve the patient, I took a No. 7 silver catheter with a larger curve, and was enabled to get through the strictures into the bladder.

Two days subsequently, Mr. Fergusson saw the patient, and detected and removed from the urethra four small calculi, the existence of which had not been suspected before. These must have escaped from the bladder, and becoming arrested at the strictured portion of the canal, had assisted in bringing about retention of urine.

Reference has been made in an earlier part of this work to the connexion between affections of the rectum and retention of urine, as cause and effect. It is highly important to bear in mind this fact; otherwise we may be at a loss for the right cause, and may thus put in

force an incorrect practice. A striking instance of this nature occurred to me on the evening of the 1st of this March. An aged gentleman came to my house, from one of the suburbs, in great distress from retention. Whilst getting ready to relieve him, I ascertained, by putting some questions, that he had never had gonorrhœa or stricture, and had never had a catheter passed. These facts were pretty conclusive that there was no organic narrowing of the canal; so I took a No. 7 catheter for the purpose of relieving the bladder, and just before I had commenced its introduction the patient complained of something behind; and, on examination, I found a prolapsus of the rectum. I at once informed him that this was the cause of the retention, and the easy introduction of the catheter proved that there was no organic narrowing of the canal.

In such a case, it is necessary to adopt measures for preventing a recurrence of the prolapsus; otherwise the patient will be liable to an attack of retention at any time.

There are many cases in which spasmodic stricture is marked by a tendency to irritability and discomfort, rather than by absolute retention of urine. In such cases, it is very necessary to look after and ascertain the cause of the phenomena. Indulgence in wine of a bad quality, exposure to cold, or some mental influence, will be found to cause irregular spasmodic action of the urethra. And the indications for treatment are, the correction of the state of the stomach and bowels, the production of diaphoresis, and the withdrawal of disturbing mental influences. The introduction of instru-

ments in most of such cases will do more harm than good.

It cannot be too much insisted upon, that it is highly necessary to adopt proper hygienic and medical treatment in all cases of spasmodic stricture, both for the purpose of relieving and preventing spasm and retention.

It is important to guard against being deceived by the escape of urine which occurs in some of the worst cases of retention, and which might lead one to suppose that the bladder was empty, whilst in reality it is distended to the utmost; for, without due examination, surgeon, patient, and attendants may be greatly misled. And this will especially obtain in certain instances where the patient, under such circumstances, does not suffer any pain. A remarkable illustration of this immunity from suffering was seen some time since in King's College Hospital.

Case V. The patient, aged forty, was admitted, April 29th, with stricture, but did not complain of any particular pain; so that nothing was done until the visit of the surgeon of the day (Mr. Fergusson), on May 1st. The man was even then not complaining; but, on examination, he stated that his urine was dribbling away continually; and in proof of this he exhibited his shirt, which was found completely saturated: and the abdomen was found greatly swollen by a tumour, which was surmised to be a distended bladder—although it was considered to be an unusual thing for so young a man to be suffering so little pain with a bladder distended to such a degree. To clear up the point, however, Mr. Fergusson took

a No. 3 silver catheter, and with great difficulty introduced it through a tight stricture, and drew off an immense quantity of water.

Case VI.

In September last, I was sent for, by a neighbouring practitioner, to relieve the bladder of a patient (a young man) who was suffering from phthisis, and had old stricture. Retention of urine had existed the day before, and my friend had endeavoured to relieve the patient with a gum-elastic catheter, but, by all accounts, without success. On getting to the patient's bedside and making an examination, I found that a large quantity of urine had been passing away from the patient; but, from the history of the case, and from the appearance of the abdomen, I had no doubt that the bladder was distended, and expressed a wish to introduce a catheter. At this the patient's wife expressed astonishment, as he had, she informed me, made plenty of water. However, I persuaded them to allow me to introduce a silver catheter; and, to their great surprise, I drew off a large quantity of water.

Where these measures fail.

But it will happen that the surgeon is called to a case where the patient has been suffering for hours from inveterate retention. Perhaps numerous attempts have been made to introduce a catheter, with the effect only of putting the patient to increased pain; producing bleeding, and probably lacerating the urethra. The plan just recommended is tried, but it does not succeed, and a fair attempt is made to pass a catheter. The retention of urine is the most prominent feature of such a case, and in all probability there is present an organic stricture of the urethra: the retention is not caused by the stricture becoming *actually* imper-

meable, but it is rendered so for a time by the supervention of spasm.

It is better to lay aside all instruments. The patient should at once be placed in a warm bath, if possible, and whilst in it, he should take a drachm of laudanum, or a grain of morphia. In numerous instances these measures will succeed. If, however, the one dose of laudanum should fail in its effects, another should be given; for it must be borne in mind, that as the individual is suffering intense agony, he will be able to bear a great deal of the narcotic.

Warm bath.

Opium.

If the spasm should not yield after a fair trial of these remedial measures, it will be well to inject into the rectum a pint of *very cold water*, containing a drachm of laudanum. The influence of the cold water will sometimes be favourably exerted, especially if the warm bath has been tried previously and has failed.

Injecting cold water up the rectum.

If these measures do not succeed, the surgeon may endeavour to overcome the spasm by forcibly injecting up the urethra one or two syringefuls of warm water. This has been known to succeed when everything else has failed.

Injecting warm water up the urethra.

There is one other remedial measure in our possession which must always be tried in obstinate retention of urine before any operation is resorted to—viz., chloroform. And here it is proper for me to make a few remarks regarding its effects on the urethra in such instances. We are well aware of the relaxing effects of this agent on all the muscular tissues of the body, and it is therefore not surprising that its administration has been attended with most marked and beneficial results in cases of undilatable stricture, and of retention of urine

Chloroform.

induced by spasm. I have myself had opportunities on three or four occasions to witness this fact. Not long since, I was requested by a friend, a skilful surgeon, to aid him in laying open the urethra in a case of supposed impassable stricture. This gentleman had not been able in several attempts to pass an instrument into the bladder of the patient, who was enduring most miserable sufferings. Everything was ready for the operation, when the full effect of chloroform being obtained, my friend introduced a small grooved staff along the canal, and endeavoured to pass it into the bladder; but not succeeding in this, he took a No. 7 catheter, and was able to carry it without difficulty into the bladder, and afterwards a No. 10. Of course, the intended operation was not performed.

It must be stated that in this case there was the utmost irritability of the urethra, and several false passages had been made in the numerous catheterisms to which the patient had been subjected both in London and in the country; so that, in fact, the impossibility to introduce any instrument under ordinary circumstances was not so much dependent upon organic narrowing of the canal, as upon spasm and the existence of these false routes. Under the influence of chloroform this spasm was relaxed, and the surgeon was not obstructed by the sensitiveness of his patient in his fair endeavours to guide the catheter in the right direction. I have seen two or three instances of a somewhat similar character to this; but a case peculiarly illustrating the beneficial effects of chloroform during acute retention of urine fell under my observation, whilst going round the wards of King's College Hospital some little time ago.

Case.

The case was that of a poor miserable Lascar, who was brought in suffering acutely with retention of urine. Mr. Fergusson endeavoured to pass a No. 6 silver catheter into the bladder; but the patient seemed to suffer exceedingly, and strained violently, so that the voluntary muscles acting upon the urethra and neck of the bladder must have been thrown into a state of contraction. Cautious attempts were made to get an instrument along the canal, but the point was invariably arrested under the pubes. The patient was now placed fully under the influence of chloroform, all movements were subdued, and a No. 6 catheter was passed into the bladder with ease. Mr. Fergusson made the remark to the pupils, at the time, that this case well illustrated the action of the anterior fibres of the levator ani upon the back part of the urethra, when they were thrown into a spasmodic condition.

Such a case teaches a lesson which should be remembered; and this is, that chloroform should always be used in an obstinate case of retention, where the surgeon finds his efforts fail to relieve the patient without it.

Catheter to be finally tried.

Should the spasm continue persistent, and, notwithstanding the trial of these several plans, should it resist surgical attempts—and should the patient become much distressed by the retention evidenced by a greatly-distended bladder, a brown dry tongue, a rapid pulse, and wandering mind—a fair and final attempt should be made, under chloroform, to pass a catheter. Either a small gum-elastic set on a stiff stilet, or a small silver instrument, must be passed down to the stricture; and the surgeon, bearing in mind the anatomy of the parts, should patiently and firmly endeavour to pass the

catheter through the stricture into the bladder: and in doing so, he is justified in using some force, if he finds that the rings of the catheter are perfectly horizontal, and if, by placing his finger in the rectum, he can feel that the point of the instrument is not *below* or deviating to one or other side of the canal. It is most important to take the latter precaution, for it is extremely easy to pass the point of an instrument through the coats of the rectum itself. If a false passage has previously been made along some portion of the canal, the surgeon will have a most difficult business; and it is to be feared that the instrument will deviate in that course, with all his care. If a fair and lasting attempt does not succeed in relieving the retention of urine, and the patient is getting worse, the only resource left is to *puncture the bladder*. But the surgeon who is called to a bad case of retention of urine should go with a determination to relieve his patient *without* puncturing the bladder; for perseverance often succeeds even in the most desperate cases: indeed, it is almost impossible for any one to have had much practice in cases of stricture, and not to have been on the point of giving up a case of retention of urine, and yet by a final effort succeed with the catheter.

Puncture of bladder.

Dessault.

Liston.

Very rarely necessary.

Fergusson.

The celebrated Dessault, after *ten* years of experience as surgeon to the Hôtel Dieu, had only on one occasion to puncture the bladder; the late Mr. Liston had only to do it once or twice during the whole of his extensive experience in hospitals and in private practice; and Mr. Fergusson, who has passed a number of years in large practice in two hospitals and with private patients,

informs me that he has never even seen the bladder punctured.

Nevertheless, it is an undoubted fact that circumstances will arise which will necessitate this operation. If all other measures have been fairly tried—if retention of urine has lasted for upwards of forty-eight hours, and the symptoms are becoming extreme, the measure must be resorted to for the actual purpose of saving life, which is now placed in imminent danger.

Three methods.

It is well known that there are *three* methods of finding a passage into the bladder by means of a cutting operation.

The organ may be punctured *above the pubes, by the rectum,* and *through the perineum.*

The expediency and relative merits of these operations present so wide a field for discussion, that it would be out of the question for me to enter upon it in this work; but I shall in a very brief manner state what are the conditions in which each operation is most proper.

Above the pubes.

Puncture above the pubes is a measure which it is only desirable to adopt when there is insuperable retention from disease of the prostate, or where it is produced by stricture, and the surgeon does not feel himself competent to undertake the responsibility of cutting through the perineum, or by the rectum, as it is an easier operation.

By the rectum.

Puncture by the rectum seems to be the favourite mode of proceeding with some excellent surgeons; and it has the advantage of being an easier operation than that of cutting through the perineum. But there are

these disadvantages connected with it: the peritoneum may descend very low, and thus it may be wounded, and death may ensue; a fistulous aperture may remain between the bladder and the gut. But perhaps the main objection to this proceeding is, that it does not touch the cause of the mischief it is intended to overcome. It cannot, moreover, be effected in cases of enlargement of the prostate, and therefore it is almost only desirable in cases of retention where there is no organic mischief, or where the organic stricture is very slight.

Cock. Mr. Cock, of Guy's Hospital, is, however, a most strenuous advocate of puncturing the bladder by the rectum, and has had the most signal success with this operation.

Mr. Cock brought before the Medico-Chirurgical Society, in 1852, his views upon the subject of puncturing the bladder by the rectum. This gentleman seems to have had a large success with this operation, which was recommended by him not alone for absolute retention of urine, but for the purpose of remedying inveterate stricture and preventing its bad results. The effect of making an artificial opening into the bladder is, according to that gentleman's experience, to improve the state of the canal to such a degree, that, after a time, the stricture may be rendered more amenable to treatment; and it appears to me that nothing can be more reasonable than this view. Of course, it may well be questioned whether so severe a kind of practice is necessary for the reduction of even a very bad stricture. I apprehend that with the use of potassa fusa I should be able to open up the urethra in such case as Mr. Cock has referred to: nevertheless, there are some conditions of the urethra where it would

not be prudent to interfere with the canal, and the formation of an artificial opening, either by the membranous portion of the urethra or through the rectum, would be a mode of treatment which would at least keep the canal free from irritation.

My friend Mr. Gay has also strongly recommended puncture of the bladder through the rectum in those cases of spasmodic retention where the urethra has been irritated or injured by previous and vain attempts to pass instruments into the bladder, rather than persist in their employment when the canal has been irritated in a great degree: and I must confess that it appears more reasonable to relieve the distended bladder by the operation of puncture through the rectum, than to persist in using metallic instruments, which, in all probability, instead of safely reaching the bladder, will, under the circumstances mentioned, only excite additional mischief.

Those who recommend forcing a stricture with a catheter in cases of obstinate retention will, of course, object to this view. There are, however, not many surgeons who would recommend this desperate measure where retention depends upon stricture alone. When it depends upon enlargement of the prostate, or upon an abscess in that structure, the catheter may with great care be thrust through into the bladder. I have only within the last few weeks had an interesting case of retention from abscess, where I forced the catheter through it into the bladder; but I should be sorry to suggest it in a case of stricture, for it must be totally impossible for the very best surgeon to carry the instrument in the right direction in some cases.

Puncture of the bladder, either above the pubes or by the rectum, is a safer measure; and as an instance of the comparative freedom from danger attending the operation, I may mention that whilst in Jersey last autumn, my friend Mr. Jones—who has done so much for surgery—showed me a man upon whom he had three times punctured the bladder above the pubes, and had subsequently performed perineal section.

By the perineum.

Puncture of the bladder by the perineum—or rather puncture through the stricture—is the last measure to be considered; and it is that which, in the hands of a good surgeon, possesses the greatest superiority in some instances of retention of urine dependent upon severe organic stricture; for, as has been before stated, this condition is for the most part the effect of spasm, added to or supervening upon the pre-existing contraction. Now, the other methods of puncture of the bladder, just considered, only relieve the retention, but do not touch the cause of the evil: but, by puncturing through the perineum, the incisions may be so managed that the contracted portion of the urethra shall be divided at the same time that the distended bladder is relieved, and thus the effect and cause may be removed together, and this must be looked upon as a most desirable object to be attained.

The only instance of puncture of the bladder which I have actually witnessed, or have been engaged in, was a dreadful case of retention of urine, where the operation was done by dividing the stricture through the perineum.

Case.

On April 3rd, 1850, my friend Mr. Nunn requested my assistance in the case of a poor man who was suffering from retention of urine. On examination, it was found

that the patient was in a very depressed state: the bladder was greatly distended, there was great induration and deposit of pus about the perineum, and it was not possible to introduce any instrument further than the front of the bulb. It was necessary to give the patient immediate relief, and it was determined upon to puncture through the stricture from the perineum. Mr. Nunn passed a small sound to the face of the stricture, cut upon its point, and divided the anterior part of it; then a No. 7 grooved staff was passed in, and the knife was carried along it until the whole stricture was divided. A No. 8 silver catheter was then introduced, and half a gallon of urine, mixed with a large quantity of matter, was drawn off. The operation was quickly and admirably performed. In the evening the man was found to be much relieved; pulse firm and regular. On the next day he was also doing well; but on the 5th he had a convulsive fit, and after some hours died.

This man was in such a low condition when operated upon, that it is just possible puncture by the rectum might have been performed with better success. It is my belief, however, that the man was poisoned by urea. At any rate, no attempt to save life could have been made in a more masterly manner.

It is true that this operation has its disadvantages, for it is sometimes extremely difficult to perform. The surgeon has to cut without any other guide than his knowledge of the anatomy of the parts: it therefore requires an amount of skill and determination which every one does not possess, and the operation should most certainly never be undertaken by any one who has

not been in the habit of using surgical instruments pretty often.

Puncture above the pubes is performed as follows:—

The patient being laid upon his back, and in a convenient light, is placed under chloroform. An incision about two inches long is made above the pubes through the integuments and linea alba, when the bladder will be exposed. An assistant should now steady this viscus by placing his hands on the lower part of the abdomen, and the surgeon either opens the bladder with the knife, or with a trocar and canula: the last is the best instrument, but in such an emergency it is not always at hand. It must be borne in mind that the bladder is always in a state of great distension when this operation is required, and that, when emptied, the wound made in it will not quite correspond with that made through the textures which cover it. It is well, therefore, not to puncture it too close to the pubes. The peritoneum will be necessarily out of the way of the knife when this operation is required. Of course, it will be necessary to retain the canula or a hollow tube in the bladder until a passage is made through the urethra.

Puncture by the rectum is performed as follows:—

The patient, previously placed under the influence of chloroform, lies upon his back, his knees being drawn up and held as they are in the position for lithotomy, by two assistants. A very careful exploration with the left fore-finger previously introduced into the rectum is now made, and the posterior boundary of the prostate gland is, if possible, made out. The trocar and canula, which is slightly curved and about seven inches

long, is then introduced along the concavity of the finger, and the point is thrust into the bladder behind the prostate; the stilet is withdrawn from the canula, and the latter is left in the bladder, and is retained there by suitable appliances. Of course, the opening must be kept patent so long as the urethra remains impermeable. It must be borne in mind that in cases where the enlargement of the prostate is great, the space which is uncovered by peritoneum is encroached upon; and it is just possible to wound this membrane, unless it is avoided by making the puncture close to the prostate. Whilst the instrument is being carried along the rectum, its point must be concealed in the canula. Previous to the operation, the rectum should be cleared out by an enema.

Puncture through the perineum, according as it was done by Sir Astley Cooper, is now scarcely to be recommended. An incision was made by the side of the middle line of the perineum, and the bladder was reached either by the knife or trocar in the same direction as it is by lithotomy: but this proceeding without any guide must necessarily be most difficult. Puncturing through the stricture, difficult as it is in some cases, is an admirable operation, insomuch as it effectually deals with the cause of retention: it is fully described in the chapter on Perineal Section.

In puncture of the urethra behind the stricture, as recommended by Mr. Guthrie and others, a staff is first placed against the stricture; an incision is then made about half an inch above the verge of the anus in the median line directly down upon the membranous portion of the urethra, the finger being kept in the rectum,

in order to guide the knife and keep it away from the gut. The stricture may then be divided from behind forwards at the point of the staff.

I cannot do better than finish these remarks on puncture of the bladder by quoting the words of our most distinguished surgeon, Sir Benjamin Brodie, in reference to this proceeding:—

Brodie.

"After all, however necessary it may be to the safety of the patient in some instances, it is an operation which is very rarely required. Surgeons who see a great number of cases of retention of urine may, in the course of their lives, be called upon to perform it in a *few* instances. Those who perform it frequently *must often perform it unnecessarily:* at least, this is what I am bound to say, judging from my own experience."

THE END.

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