

Stricture of the urethra, its complications and effects : with practical observations on its causes, symptoms, and treatment, and on a safe and efficient mode of treating its more intractable forms / by Robert Wade.

Contributors

Wade, Robert, 1788-1872.
Royal College of Physicians of Edinburgh

Publication/Creation

London : J. Churchill, 1853.

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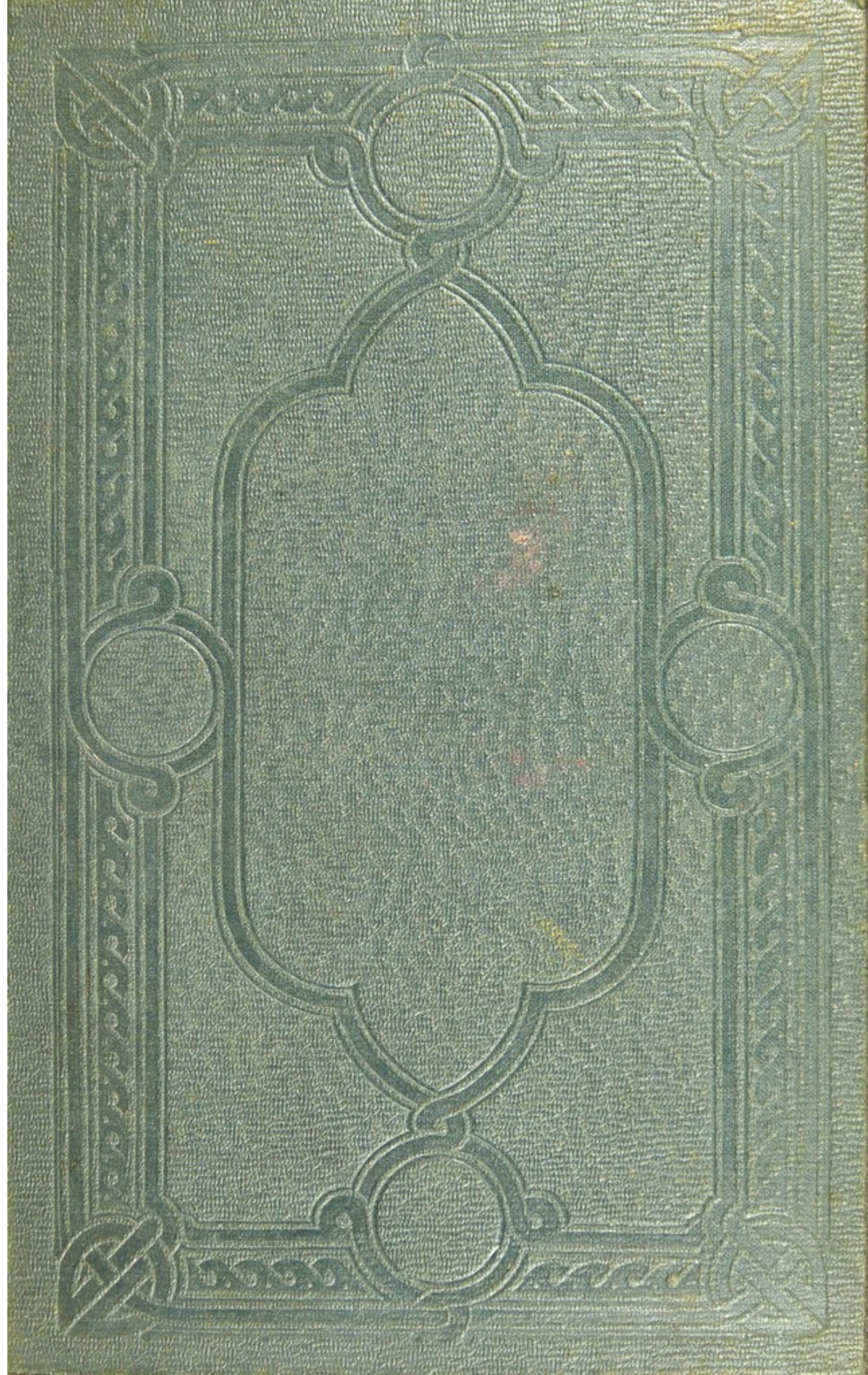
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STRICTURE OF THE URETHRA,

ITS

COMPLICATIONS AND EFFECTS :

WITH

PRACTICAL OBSERVATIONS

ON ITS

CAUSES, SYMPTOMS, AND TREATMENT :

AND ON A

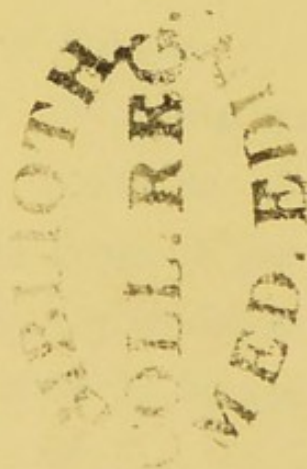
SAFE AND EFFICIENT MODE

OF TREATING ITS MORE

INTRACTABLE FORMS.

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LONDON :

J. CHURCHILL, PRINCES STREET, SOHO.

MDCCCLIII.

LONDON :

G. J. PALMER, SAVOY STREET, STRAND.

PREFACE.

THE following pages are the result of a desire to produce a comprehensive treatise on Stricture of the Urethra, comprising its various complications and effects; and whilst I have introduced into this volume some of the more practical observations (including cases) which appeared in my former publication on the same subject, the utility of the work has been enhanced by quotations from the writings of some of the most eminent authors on this class of diseases.

In discussing the different modes of treatment adopted, I have endeavoured to do justice to all. When speaking of the more intractable forms of urethral obstruction, it has been especially my object to recommend such as experience has shown to be the most safe as well as the most efficient.

With reference to the illustrative cases, I venture to hope that they will prove not the least important part

of the work, by the information which they afford regarding many minor details which could not be so conveniently noticed in connection with the general treatment of the subject.

Dean Street, Soho Square,

November, 1852.

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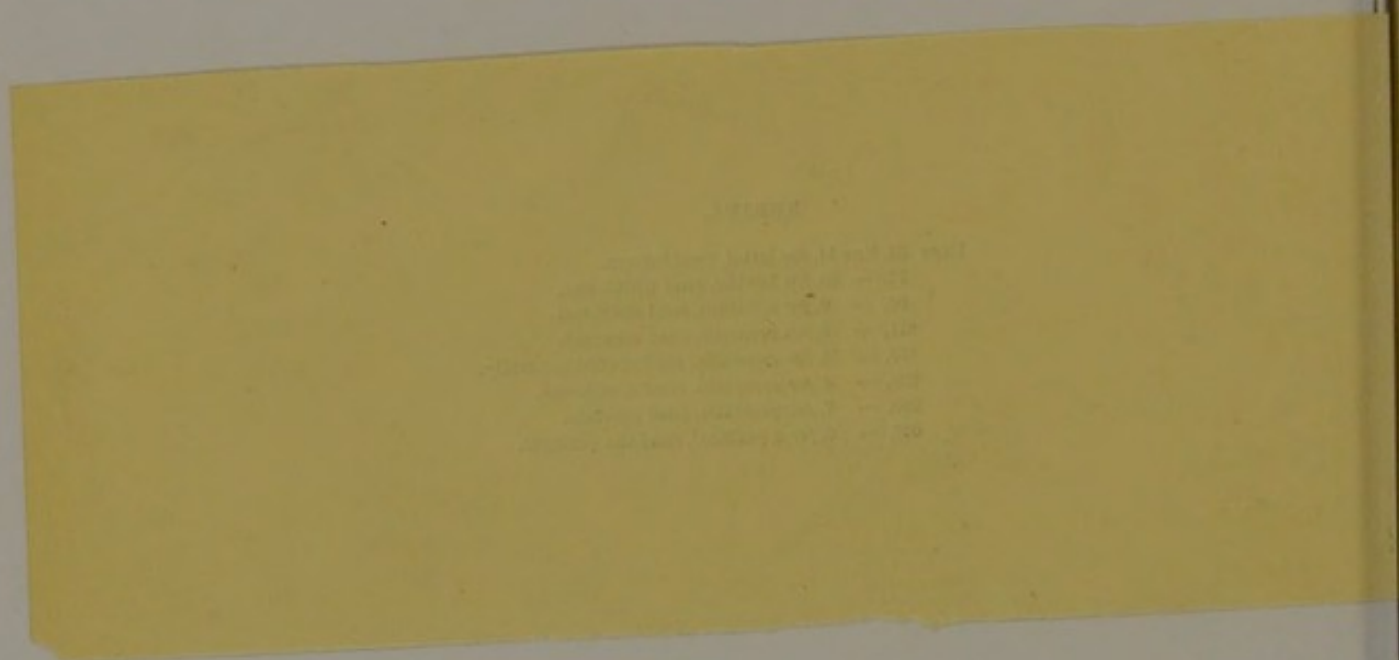
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ERRATA.

- Page 34, line 14, *for latter, read former.*
75, — 20, *for having, read which has.*
96, — 9, *for stricture, read strictures.*
211, — 8, *for recurred, read occurred.*
217, — 16, *for generally, read should generally.*
288, — 4, *for symptom, read symptoms.*
290, — 7, *for prostatic, read prostate.*
328, — 6, *for a perineal, read the perineal.*



STRICTURE OF THE URETHRA.

CHAPTER I.

GENERAL OBSERVATIONS—ON ITS NATURE, CAUSES, AND EFFECTS.

THE term stricture, in surgical language, signifies a morbid obstruction in some of the ducts or canals of the human body, either of a transient nature, the result of irregular muscular contraction, or of a more persistent character, from some alteration of structure in the part affected.

The urethra is peculiarly liable to both kinds of obstruction—the former is called spasmodic, the latter, permanent stricture. Urethral obstructions, however, occasionally arise from external causes, as abscesses or other tumours, which by their pressure, may either partially impede or completely obstruct the passage of the urine.

In permanent strictures, various degrees of condensation of the lining membrane of the urethra and its sub-

jacent textures are observed at the seat of obstruction, by which the normal elasticity of the canal has been more or less impaired. Sometimes the stricture consists of a narrow white band, extending entirely or partly around the urethra; not always, however, in a circular manner, but sometimes in an oblique direction. The band may present a somewhat crescentic form extending across the inferior portion of the canal. This has been called the bridle stricture. When narrow and circular, it was compared, by Mr. Hunter, to a thread tied round the urethra. The obstruction may resemble a piece of whipcord, called by Sir A. Cooper the corded stricture. In some instances a flat circular band extends an inch or more along the urethra, which is the ribbon stricture of the same author. In some cases of rare occurrence the greater portion of the urethra has been contracted.

The alteration of structure may be confined to the mucous membrane of the canal, but, generally, the subjacent cellular texture is more or less thickened; and, should the disease have been of long duration, the elastic tissue will mostly be found to have lost its healthy pliability. In old cases, the cells of the corpus spongiosum become obliterated to some extent, forming a hard gristly mass at the seat of obstruction. This hardness may embrace an inch or more of the canal; and, sometimes, from its irregularity, when an instrument is passed through the stricture, the latter feels rugged and cartilaginous. Considerable hardness and irregularity may, however, be produced without any disease of the corpus spongiosum. When the obstruction is an inch or more in extent it is very probable there may have been originally two strictures, and that the urethra between them had become subsequently contracted and thickened.

The urethra at its strictured portion has been compared to a double funnel, the funnel-like appearance is, however, observed principally behind the obstruction, which part of the canal is often much dilated. The mucous membrane immediately anterior to the stricture is usually corrugated, and mostly at the seat of obstruction in a state of chronic inflammation or congestion, possessing augmented sensibility, which will be evident on pressure from the introduction of a bougie. The anterior part or face of a stricture is often its most irritable part, very slight pressure causing considerable pain. Old hard gristly strictures, however, have sometimes but little vascularity and are remarkably deficient in sensibility.

When a stricture causes much impediment to the flow of urine, the urethra behind becomes, in many cases, considerably dilated, especially if the obstruction exist at the commencement of, or anterior to, the bulb. An extraordinary instance of this dilatation is mentioned by Sir B. Brodie, which, whenever the patient voided his urine, formed a fluctuating tumour in the perineum, of the size of a small orange. The mucous membrane posterior to the stricture will often be found thickened to a greater or less extent, having sometimes an irregular tuberculated appearance, apparently from depositions of lymph which have become organized. From the diseased state of this part of the urethra ulceration may occur, or the canal may be ruptured by the powerful expulsive efforts of the bladder. In many such cases it fortunately happens that the cellular membrane in the vicinity of the stricture has been previously condensed by effused lymph, which forms a firm barrier around the breach by which extravasation of urine is prevented.

The consequences, however, are very different when this thickening has not taken place ; for then the urine, urged on by the powerful action of the bladder, infiltrates the external cellular tissue, the progress of the fluid being directed by the superficial fascia upwards and forwards, soon distending the scrotum, penis, and very probably extending to the inguinal regions, or even beyond those parts, it having been known to reach the axilla on each side. Under such circumstances, the sufferer, who has perhaps been for many hours previously in agony, experiences instant relief, and probably falls asleep, quite unconscious of the mischief which has occurred. This tranquillity, however, will be but of short duration, his situation being one of extreme peril, which he will seldom long survive, unless efficient surgical aid be promptly administered, and even then that aid will not always prove successful. In such cases time is most precious, as every minute's delay diminishes the patient's chance of recovery. The effused urine quickly destroys the cellular tissue, sloughing soon follows, and when the destruction is extensive, a vigorous constitution can alone withstand it. The symptoms of this deplorable state are of the low typhoid character, the brain and nervous system very early indicating greatly depressed powers, the prostration, probably resulting in a great degree from absorption of the highly acrid and putrid urine. A black spot is sometimes observed upon the glans penis, significant of effusion of urine into the corpus spongiosum. It must, however, be consolatory to know, that extraordinary recoveries have occurred after most extensive destruction of tissue from extravasation of urine. In many cases, from the irritation caused by the stricture, the cellular membrane external to the urethra becomes inflamed, and an

abscess forms; or suppuration may ensue in consequence of the escape of a few drops of urine into the cellular tissue from a small ulcerated opening in the tube. Such an abscess, if left to itself, will be most likely to open externally in the perineum, or internally, into the urethra, although it may burst into the rectum. When these abscesses communicate with the urethra, fistulous openings will be left. In extensive extravasation of urine, fistulous openings are sometimes formed above the pubes, or in the inguinal regions. These fistulae usually afford relief to the patient whilst they remain open, as the greater part of the urine will probably be passed by these preternatural channels, so that the pressure of that fluid against the stricture becomes materially lessened, when a highly favourable opportunity is offered for dilating the contraction. Such an opportunity should not be neglected, for whilst the urine finds a free passage behind the stricture, safe and efficient means can almost invariably be adopted for the removal of the obstruction. As the urine passes more freely through its natural channel, the fistulous openings will, in most cases, be found gradually to close. If, however, effectual means be not adopted to remove the stricture, another abscess will be likely to occur, thus urinary abscesses may form successively, so that there may be several external openings with fistulous tracks winding their way along a hardened mass of condensed cellular tissue, all communicating directly, or indirectly, with the urethra.

In aggravated cases of stricture, the whole urinary apparatus behind the contraction may be more or less diseased. A calculus may lodge in the urethra behind its strictured part, and cause retention of urine. Occasionally the urethral canal behind the stricture has been

found studded with tubercles, or encrusted with lymph and calcareous matter. Inflammation may creep along the ejaculatory ducts to the testicle, causing considerable enlargement of that organ, often attended with such a scirrhus-like hardness as to excite a suspicion of the existence of malignant disease. The ducts of the prostate are, in some instances, so much dilated as to admit the point of a good-sized bougie; and the gland itself is occasionally diseased, being either much hardened and enlarged, or disorganised by abscesses. In other cases of rarer occurrence the prostate becomes considerably softened.

In a man of extremely intemperate habits, who died from rupture of the urethra, at the age of forty, having suffered for half his life more or less from stricture, I found the prostate much enlarged, of a dark chocolate colour, studded with patches of lymph, and so soft as to be broken up by very slight pressure. In narrow strictures of long continuance the bladder usually becomes contracted and thickened, sometimes to the extent of a quarter of an inch, or even more, partly from hypertrophy of its muscular coat, and partly by condensation of the mucous and submucous vesical tissues, the result of inflammation. From obstruction to the free egress of urine, pouches are sometimes formed in the bladder in consequence of its mucous coat having been forced between the fibres of the detrusor. The bladder has been known to burst from distension of urine resulting from stricture; but such an occurrence is extremely rare, as the urethra is almost certain to give way before the bladder. The ureters and pelves of the kidneys may be dilated to a great extent, when the glandular structure of the latter will usually be found atrophied.

Various other changes in the kidneys, effects of inflammation or congestion, are observed; sometimes they are much softened, of a deep purple colour, and when incised, a serous fluid is very freely poured out; or they may be disorganised by abscesses. A disease first accurately described by Mr. Guthrie, in his excellent work on "Diseases of the Bladder and Urethra," I have observed, in a very few instances, to accompany stricture at the bulb or membranous portion of the urethra. In two cases under my care, in which there was great difficulty in micturition, combined with incontinent dribbling of urine, especially during the night, I found that, after having succeeded in getting an instrument through a hard stricture at the bulb, there was a second obstacle at the neck of the bladder quite as difficult to surmount as the first. The latter obstruction, which felt rigid, yielded very slowly to the introduction of steel sounds, with an occasional application of potassa fusa. Although at first inclined to attribute the obstruction to some enlargement of the prostate; yet from the patients' being only of middle age, and both completely recovering, I have now, but little doubt that the obstacle at the vesical orifice arose from the disease so clearly described by Mr. Guthrie. That gentleman has satisfactorily shown that, without any affection of the prostate, "the elastic tissue at the neck of the bladder may be diseased, forming a bar or dam preventing the free evacuation of the urine."

Impotence may be added to the infirmities of a patient suffering from a highly contracted stricture, in consequence of the seminal fluid, instead of being properly evacuated, either passing backwards into the bladder, or remaining in the urethra behind the obstruction, and afterwards gradually trickling away.

Of the nature of stricture of the urethra different opinions have been entertained. Mr. Hunter, Sir E. Home, Mr. Wilson, and those who believed in the muscularity of the urethra, attributed the disease to a wrong action of some of the muscular fibres surrounding the canal. Sir C. Bell, Mr. Shaw, and others, entirely denied the muscularity of the urethra, and, of course, rejected Mr. Hunter's explanation of the pathology of stricture.

Morbid anatomy affords indisputable proof of inflammation in all cases of permanent stricture, and in the various stages of inflammation we have a satisfactory explanation of the whole phenomena observed in that disease. My own observations fully confirm the opinions of those who regard inflammation as the cause of permanent stricture of the urethra. These opinions are corroborated by an examination of strictures of the alimentary canal, which evidently arise from inflammatory condensation, with the exception of those produced by mechanical obstructions, carcinomatous, or other morbid deposits. Such depositions affecting the parietes of the urethra and diminishing its calibre, are, however, I believe, of rare occurrence.

Some authors attribute the formation of strictures principally to the healing of ulcers. Others, amongst whom are Ducamp and Laennec, consider them most commonly to originate from the organization of false membranes upon the free surface of the mucous lining of the urethra. Mr. Hancock has met with two or three cases in which strictures were caused by a false membrane deposited upon the free surface of the urethral canal, and appears to think that permanent obstructions from this cause are of frequent occurrence. The result of my own experience, from many careful examinations,

is, that such strictures form an exception to the usual method of their formation, which is by inflammatory condensation of the mucous and subjacent urethral tissues. As, however, the calibre of the canal is equally obstructed in either case, the question as to the precise mode in which the obstruction is formed is of no practical importance, the treatment being exactly similar in both instances, which is certainly fortunate, as it would be impossible to distinguish, during life, the one from the other.

If it be admitted that inflammation is commonly the cause of strictures, we are naturally led to inquire why they should occur so much more frequently in the urethra than in the alimentary canal, which from its great length might be imagined as peculiarly predisposed to such affections. The male urethra, being the seat of gonorrhœa, may probably sufficiently account for the circumstance, as young men are generally the subjects of both diseases. It is my belief that gonorrhœal inflammation is the foundation of by far the greater number of urethral strictures, especially when, from neglect or other causes, the discharge has remained for a long time in its chronic form of gleet.

We usually find that the subjects of strictured urethra have, previous to the occurrence of that disease, been affected with gonorrhœa; and although such a sequence does not necessarily prove the one disease to be the consequence of the other, the supposition is certainly strengthened by the much greater frequency of morbid thickenings in the male urethra than in other canals. A question of considerable practical importance here suggests itself—Are strictures more likely to follow gonorrhœa, when injections have been used in its treatment, than when they have not? It is very

probable the answer to this question may not prove sufficiently satisfactory to produce conviction in the minds of others. As, however, it is an every-day occurrence for strictures to form after gonorrhœa, when no injections have been used; and as contractions of the urethra generally result from long-continued chronic inflammation, it seems to me that, instead of rejecting local astringents, as being likely to cause such contractions, they may, with good reason, be had recourse to for their prevention. That strictures may originate from the injudicious employment of injections in the acute stage of gonorrhœa, is indeed highly probable; but such a practice is apt to prove injurious in so many respects, that no surgeon of much experience is likely to adopt it.

When injections are used in the chronic stage of gonorrhœa, after the pain caused by the urine passing over the inflamed part of the urethra has entirely or nearly subsided, they will in general be found very effectual in curing the disease. It surely, then, may be inferred that injections, when properly used, are more likely to prevent than to cause stricture. It has been a subject of debate whether scrofulous persons are more liable than others to urethral obstructions. It certainly has not appeared to me that strumous inflammation has at all predisposed to stricture. This assertion may appear somewhat inconsistent with a previous one, that continued gleet was often the cause of stricture, did not the circumstance of the less tendency to the effusion, and subsequent organization of lymph in scrofulous than in healthy subjects, sufficiently account for the apparent inconsistency.

That strictures of the urethra do not, in many cases, arise from specific, but are produced by common in-

flammation, is evident from their occasionally occurring before the age of puberty. Besides, as common inflammation causes stricture in other canals, there can be no good reason why it should not do so sometimes in the urethra. If I were asked what is the most frequent cause of urethral stricture, next to a protracted gonorrhœa, my answer would be, the pernicious practice of self-abuse, which, in many instances, to my knowledge, has given rise to strictures, mostly at the bulb, and of a very troublesome nature, from their having been attended with extreme morbid sensibility, not merely at the seat of obstruction, but of the whole urethral passage.

Stricture occasionally, although very rarely, occurs in the female urethra. I have seen only two instances. The obstruction in each was close to the external urethral orifice. They both readily yielded to the introduction of steel sounds.

Stricture may happen at all ages, but is rare before puberty. The healthy urethra possesses great elasticity, and it is the diminution of this elasticity from inflammation in some part of its course preventing the free dilatation of that portion of the canal, during the action of the bladder, which constitutes the early stage of stricture. In this stage, it is probable that a slight effusion of lymph has occurred, causing preternatural adhesion of the lining membrane of the urethra to its submucous tissue. In this state, a bougie, when introduced, of the full size of the urethral orifice, will meet with more or less obstruction at the affected part, in passing through which the instrument causes a more painful sensation than at others. It is to such a stricture that the term *dilatable* has been applied, although, with strict propriety, the same appellation

might be affixed to others of a more serious nature ; to any, in fact, in which the urethra can be restored to its healthy integrity. The term dilatable stricture, as commonly used, means an obstruction possessing but slight irritability, in which the healthy elasticity of the urethral tube is only impaired, not lost, so that its dilatation is soon effected. When the strictured portion of the urethra has become much condensed and rigid, its proper dilatation can only be more slowly accomplished.

From an attentive consideration of all the circumstances connected with the formation of permanent stricture, it may surely be inferred that to continued inflammation, subacute or chronic, the disease is commonly to be ascribed, with the exception of those obstructions produced by calculi, enlarged prostate, or other tumours encroaching upon the urethra. The conclusion, therefore, naturally follows, that whatever causes urethral inflammation, may give rise to stricture.

The causes which chiefly tend to the production of strictures of the urethra, when placed in the order of their degree of liability to originate that disease, are—Firstly, protracted gonorrhœa ; secondly, continued chronic urethral inflammation in persons of an irritable habit, the exciting cause being very frequently the practice of self-abuse ; thirdly, the continued discharge of unhealthy urine, containing the lithates or phosphates in excess ; fourthly, external or internal injuries ; fifthly, calculi, or other causes producing irritation and inflammation of the kidneys, ureters, or bladder, subsequently extending to the urethra ; sixthly, tumours or other substances, such as calculous concretions encroaching upon the urethral tube, either from within or without ; seventhly, an hereditary tendency to the dis-

ease, of which I have seen several instances, but none so remarkable as one which lately came under my notice. In that case, the gentleman who became my patient, one of five brothers, was affected with urethral obstruction at eleven years of age; his next brother, when nine years old; and the other three, from thirteen to fifteen. In each case it was necessary to pass bougies for their relief. The father of these gentlemen was also a great sufferer from stricture. Caruncles or excrescences have been considered by some authors as not unfrequent causes of stricture. Such causes must, however, be of very rare occurrence, as Mr. Hunter, who had most probably examined a greater number of urethras than any other pathologist, in his work on the "Veneral Disease," when alluding to these excrescences, observes, "I have in all my examinations of dead bodies seen only two, and these were in old strictures, when the urethra had suffered considerably."

Congenital stricture of the urethra is extremely rare.

There is no part of the urethra in which stricture may not occur; but some parts of the canal are more liable to this obstruction than others. As might be expected, much difference of opinion prevails upon this subject, each observer being very likely to deduce conclusions upon this point solely from his individual experience. My own observations would lead me to describe the parts of the urethra most predisposed to stricture in the following order: firstly, the posterior part of the bulb at its junction with the membranous portion; secondly, the commencement of the bulbous portion; thirdly, the corpus spongiosum anterior to the bulb; fourthly, the membranous portion; fifthly, the band or bar at the neck of the bladder.

I conclude that stricture seldom takes place in the

prostatic portion of the canal, or it would have been more frequently mentioned by writers upon stricture. I have witnessed no instance of the kind myself, unless the thickened ridge at the vesical orifice, described by Mr. Guthrie, be regarded as such. A distinct contraction of this part of the urethra, without any affection of the prostate gland, has, however, been observed by the late Mr. Crosse, and one or two other surgeons.

In 130 cases of urethral obstruction, I found the bulbous and membranous portions contracted in 103, in 87 of which number no other part of the urethra was affected, whilst in the remaining 16 there also existed strictures anterior to the bulb. In 27 of the 130 cases, the obstructions were confined to the spongy portion of the canal anterior to the bulb.

Although slight strictures of the urethra may occasionally subside on the disappearance of the inflammation which caused them, without the introduction of instruments, yet, certainly, their usual course is gradually to increase, unless proper means be adopted for their removal. When once a stricture is fairly established by a thickening of some part of the urethra, its tendency to increase is in a great degree explained, by the frequent pressure of the urine against it causing irritation, which pressure becomes greater as the obstruction advances, from the additional power acquired by the bladder. The sexual functions performed by the urethra, subjecting it to frequent determination of blood, must also add to any irritation existing in that canal.

As many as seven, or even eight, strictures have been known to occur in one person; but in the great majority of cases, there are not more than from one to two, or three at the most.

In some instances, when the urethra has given way

from ulceration, leading to the formation of urinary abscess, from the subsidence afterwards of the symptoms of the urethral obstruction, there has been every reason to suppose that the stricture itself must have been included in the ulcerative process. Sir B. Brodie in his valuable lectures on the urinary organs, mentions a case in which he had good reason to conclude that a stricture was partly removed by ulceration, without the occurrence of abscess ; but at the same time observes, that "such a case is rare." We must, therefore, admit that nature unassisted, by the ulcerative process, may, in some few instances, effect a partial or a complete removal of what is called a permanent urethral stricture.

Stricture of the urethra, when fully established, and allowed to pursue its natural course, without surgical interference, must undoubtedly be regarded as tending more or less to the destruction of life ; a fact, the mention of which, at the conclusion of these general observations, will, I hope, render them more useful by inducing early attention to a disease of such importance.

CHAPTER II.

ANATOMY OF THE MALE URETHRA.

It is not my intention, nor would it be of any utility, in a practical work of this kind, to give a minute description of the anatomy of the urethra, which can only be properly acquired by dissection; I shall, therefore, confine myself to such points as relate more particularly to the pathology and treatment of stricture.

The urethra is the membranous canal, extending from the neck of the urinary bladder to the external meatus at the orifice of the glans penis. It has usually been described as consisting of two layers, an inner, or mucous coat, and an outer, or elastic fibrous coat, with intervening cellular substance. In addition to these, a peculiar muscular apparatus has lately been discovered by the microscopic investigations of Messrs. Hancock and Kölliker.

As Mr. Adams' description of the urethra, in Dr. Todd's "Cyclopædia of Anatomy and Physiology," contains the most complete as well as the most recent information upon the subject, I shall quote from that article such particular passages as appear to possess the greatest practical interest.

Mr. Adams has recorded the following observations of different observers upon the length of the urethra:—

“Whately examined the urethra in forty-eight subjects of different heights; these he arranged under the heads, viz., tall, and long, and short.

“In 16 subjects of tall stature, the urethra measured

In 1 subject 9 inches 6 lines

8 „ 9 „

2 „ 8 „

5 „ 8 „ 6 „

“In 23 of medium stature, it measured

In 3 subjects 9 inches

1 „ 8 „ 9 lines

7 „ 8 „ 6 „

2 „ 8 „ 3 „

1 „ 7 „ 6 „

“Whilst in 9 of short stature, it measured

In 1 subject 8 inches 9 lines

2 „ 8 „ 6 „

4 „ 8 „

2 „ 7 „ 9 „

“The collective average is, therefore, nearly $8\frac{1}{2}$ inches.

“Mr. Briggs, observing that most of his predecessors had examined the length of the urethra after death, made a series of examinations on the living subject. He introduced into the bladder a catheter, without a stilet, on the stem of which was marked a graduated scale of inches and fractional parts, measured from the eye of the instrument. He observes, ‘As soon as the urine begins to flow from the catheter, which has only one eye, the line marked on the stem corresponding with the external meatus, will necessarily indicate the exact length of the canal. Of sixty persons in whom

the urethra was measured thus, the length was found to vary from $6\frac{3}{4}$ to $8\frac{1}{2}$ inches. In eight instances, or rather less than one-seventh of the whole (twenty of them being persons of short stature, or not exceeding five feet four inches in height), the length of the urethra was found to be under seven inches. In forty-five instances, or three-fourths of the number, *i. e.* in persons of middle stature, the measurement was found to be between seven and eight inches, and in a few it exceeded eight. In some instances of very corpulent subjects, at an advanced age, the urethra was found to be ten inches in length.' He considers the average length of the canal to be $7\frac{1}{2}$ or $7\frac{3}{4}$ inches, the external parts being in a natural condition, neither hanging in a loose flabby state, nor unusually retracted. Briggs found the proportions of the various parts of the canal to stand relatively thus: from the orifice to the membranous part $6\frac{1}{2}$ inches, from thence to the bladder $1\frac{3}{4}$ inch, $=8\frac{1}{4}$ inches.

"Of the relative length of the different portions of the canal, M. Petrequin cites the following authorities. The prostatic portion measures, according to Boyer, fifteen or sixteen lines; Littre fifteen lines; Ducamp and Blandin, from twelve to fifteen; Lenn, thirteen; J. Cloquet, fifteen. M. Petrequin agrees with Lisfranc, that the most exact measurement is from eight to eleven lines.

"Boyer estimates the length of the membranous portion at twelve lines; Ducamp from nine to twelve; Blandin, at ten; Lisfranc, from seven to eleven. M. Petrequin has found it to vary from six to nine lines, when measured by its central axis; its upper surface measuring from eight to ten lines, its under surface from four to five, and sometimes six, the difference arising

from the projection of the bulb beneath. The mean length of the prostatic and membranous portions, taken together, is, according to Malgaigne, thirteen lines, but it varies from eleven to fifteen lines. Petrequin has found it to vary from fourteen to eighteen, and sometimes twenty. As to the bulbous and pendulous portions of the urethra, their rectilinear measurement is six inches and ten lines, and the curvilinear five inches, or five inches four lines.

“DIAMETER.—In diameter, also, the urethra varies according to age: thus, in the young subject it is small, indeed its diameter increases in proportion to the age of the individual; and in the aged, partly in consequence of the flaccidity of the parts surrounding it, partly from the loss of contractility in its own tissue, its capacity becomes immensely increased, so that it will readily admit a catheter of half an inch bore, and the escape of fragments of stone of equal size. Sir E. Home’s measurement of the diameter of the urethra in two persons—one of the age of 80, and the other 30, is as follows:—

	AT 80	AT 30
At 9 lines from the meatus it measured	5 lines	4½ lines
At 4 inches 3 lines from ditto	4 „	4 „
At 6 inches from ditto (at the bulb)	7 „	7½ „
At 7 inches from ditto (beginning of the membranous part)	4 „	2¼ „
At 7 inches 9 lines from ditto (near the prostate)	5 „	4 „
At 8 inches (beginning of the prostatic part)	4 „	3½ „
At 8 inches 3 lines (the middle of ditto)	6 „	5½ „
At 8½ inches (near the neck of the bladder)	5 „	4½ „

“Briggs remarks, ‘The portion of the urethra which

extends from the apex of the prostate forwards to a short distance beyond the arch of the pubis, and in the natural state is the narrowest part of it, when distended by an injection of wax or any other substance, greatly exceeds the rest of the canal in its dimensions, and forms a large oblong sinus from $1\frac{1}{4}$ to $1\frac{3}{4}$ of an inch in length, and in its transverse diameter, at its broadest part, from $\frac{1}{20}$ ths to $\frac{1}{10}$ ths of an inch, the part of the urethra anterior to it not exceeding $\frac{1}{20}$ ths of an inch. The broadest part of the sinus lies directly under the arch of the pubis. The narrow part of the canal, as seen in these injections, is at the point of union between the prostatic and membranous portions.'

"Briggs found the curve of the urethra to commence $1\frac{1}{2}$ inch anterior to the bulb; and from this point to its termination in the bladder, to form an arc of a circle of $3\frac{1}{4}$ inches in diameter, the chord of the arc being $2\frac{3}{4}$ inches, or rather less than one-third of the circumference. In another cast the chord of the segment was found to measure $2\frac{8}{10}$ inches of a circle, $3\frac{1}{5}$ inches in diameter, the inclination of the internal orifice, or entrance into the bladder, forming an obtuse angle with the general course of the urethra. The most depending part of the curve is at the point where the membranous portion would be intersected by a line drawn through the longitudinal axis of the symphysis pubis to the anus: this would divide the membranous part into equal parts, and pass through the most dilated part of this portion of the canal. The prostatic portion of the urethra traverses the prostate gland at the distance of about two lines from the anterior, four from the posterior, and seven from the lateral surface of the gland. In this respect, however, it varies considerably. The prostatic portion is from twelve to fifteen lines in

length, and it commences at the neck of the bladder by a round opening, which is slightly raised ; it then expands to the width of four or five lines, and gradually contracts itself into the membranous portion. It varies in length and direction in different subjects, and differs materially in these respects according to age. Lisfranc examined it in eight healthy subjects, and found the diameter of the anterior and posterior to vary from three to four lines, whilst the middle portion measured from four to five lines and a half. This is the most dilatable part of the whole urethra, and will readily admit the introduction of the forefinger. The levatores prostatae muscles, together with the pubo-prostatic ligaments, support it, and attach it to the pubis, and it is compressed by the levatores ani. The general direction of this division of the canal is obliquely downwards ; it presents a slight concavity (the prostatic sinus) at its floor, where it is traversed by the caput gallinaginis, which, running from behind forwards, divides the sinus into two equal parts. In the prostatic sinus the ducts of the prostate open, assuming a crescentic arrangement around the base of the caput gallinaginis, whilst the vasa ejaculatoria terminate usually on the side of the latter body.

“ The membranous portion of the urethra commences from the anterior part of the prostate, and extends beneath the arch of the pubis as far as the bulb ; it is included between the prostatic and spongy portions, and is covered slightly at its anterior, and under part by the bulb, so that it is really shorter below than above. It makes a slight curve, the concavity facing upwards. The concavity is at the distance of nearly an inch from the interpubic substance ; the convexity looks towards the perineum.

“Proceeding from the anterior extremity of the prostate, the membranous portion of the urethra traverses the triangular ligament which splits into two lamellæ; one, passing backwards over the prostate, is continuous with the capsule of the gland; the other advances forwards over the bulb and blends with the tendinous investment of the spongy body. The opening through which the urethra passes is round. The membranous portion forms the segment of a circle, whose radius is, according to Krause, $2\frac{1}{2}$ lines. There is a thin layer of vascular tissue, continuous in front with the spongy body, and closely surrounding the mucous membrane of this part of the urethra, between it and the muscular layers. The vessels of this extension of the spongy body pass backwards to terminate in the plexus surrounding the neck of the bladder; this is mixed up with elastic tissue, and constitutes a truly erectile tissue. An extension of the same structure enters into the formation of the caput gallinaginis.

“Between the layers of the triangular ligament, and in close connexion with the membranous part of the urethra, are found three sets of muscular fibres (*musculus urethralis*); they consist of two pairs of muscles described, one by Wilson, the others by Guthrie, and the circular fibres of Santorini, which closely surround the urethra. The ante-prostate, or Cowper’s glands, covered by the inferior stratum of the compressor urethræ, are placed beneath this part, and the arteries of the bulb are in close approximation to it, running beneath and on either side of it. The floor of the membranous portion is traversed longitudinally in the median line by the pointed end of the caput gallinaginis. If a catheter be passed into the bladder, the membranous portion can be distinguished by the finger introduced

into the rectum and drawn forwards, there being only a small quantity of cellular membrane interposed between the under part of its muscular investment and the intestine.

“Boyer estimated the length of the membranous portion at about one inch; Ducamp from nine to eleven lines; Lisfranc found it, in twelve subjects, to vary from seven to eleven lines. In these its anterior diameter varied from $3\frac{1}{2}$ to $4\frac{1}{2}$ lines, and just behind the bulb it measured at least $1\frac{1}{2}$ less than in any other part. It is universally admitted that the point of junction between the membranous and spongy portions is the narrowest part of the urethra, with the exception of the meatus.

“The membranous part of the urethra is surrounded by muscular fibres. Santorini, as early as 1724, in his ‘*Observationes Anatomicæ*,’ pointed out some transverse fibres encircling the urethra at this part; he terms them the ‘*elevator or ejaculator urethræ*,’ and describes them as being inserted into the lower part of the urethra. Mr. Wilson, in the year 1808, gives a description of two muscles surrounding the membranous part of the urethra, the origin of which is from a tendon attached to, the posterior part of the symphysis pubis, a little above its lower border; the muscle, thus arising from a single origin, then descends and divides into two portions, which, reaching the membranous portion of the urethra, spread themselves out by its side, and are implanted into a common tendon below it. The muscle is termed by Mr. Wilson the *compressor urethræ*. In 1834 Mr. Guthrie, in his lectures at the Royal College of Surgeons, demonstrated another series of muscular fibres surrounding the membranous portion of the urethra, and of which he considers Wilson’s muscle as

a part. Guthrie's muscle arises by a thin tendon on either side from the ramus of the ischium, and, passing transversely, splits into two portions, one above and the other below the urethra; the two muscles are connected above by a mesial tendon, which, passing forwards, is inserted into the upper part of the urethra, whilst another portion, passing backwards, is implanted into the upper surface of the front of the prostate. The under portion of the muscle is also connected with its fellow by a similar mesial tendon, which goes to the central tendon of the perineum, and, sending a slip backwards, is inserted into the under part of the prostate. The muscles are included between the two layers of the triangular ligament, and the effect of this muscular apparatus must be to support and compress this part of the urethra, and to prevent any retrogression of the seminal fluid in the venereal act. The urethra now enters the corpus spongiosum, by which it is surrounded, until its termination at the extremity of the glans penis. The spongy body surrounds the urethra equally except at the bulb and at the glans; in the former there is a much thicker layer below than above, which gives to the bulb an appearance of great dilatation, whilst at the glans there is but very little of this structure at the under part. The bulb and the glans are both dilatations of the spongy body.

“The spongy portion varies in diameter in different parts; thus dilated at its commencement in the bulb, it gradually tapers until it reaches the glans, when it suddenly expands into the fossa navicularis, to be again contracted at the meatus.

“MUCOUS MEMBRANE.—The urethra is essentially a mucous canal, performing an important part of the genito-urinary mucous system. It is continuous with

the mucous membrane of the bladder, and blends at the meatus with the cutaneous covering of the glans penis. The mucous membrane will generally be found arranged in folds, with furrows between them. The folds vary in depth and breadth, the longer are found in the under surface, and they are more numerous in this situation than above. The folds of the urethra, which are not always visible after death, result from the contraction of the submucous layer. The whole of the urethra, except the prostatic portion, is marked by minute openings, distinctly perceptible at the upper and under surface, but they are certainly larger and more numerous on the upper. They are the openings of the lacunæ or mucous glands.

“The lacunæ are mucous glands opening by minute orifices in the urethra, except the prostatic portion. Their object is to secrete a bland fluid for the lubrication of the canal. They are termed the glands of Littre and Morgagni, or the orifices are called the lacunæ of Morgagni. Their orifices face for the most part obliquely towards the meatus.

“*The lacuna magna.* Near the orifice of the urethra, within a few lines of the meatus urinarius, will be seen an inflexion of the mucous membrane, forming a cul-de-sac into which the blunt end of a probe can be passed. Its usual place is about one-third of an inch from the meatus on the dorsal aspect of the fossa navicularis. It is sometimes farther back.

“The urethral membrane is divisible into two distinct layers. The inner, analagous to other mucous surfaces, consists of a basement membrane covered throughout by epithelium. This, for the most part, is of a scaly character, but in the vicinity of the bladder it is spheroidal.

“Beneath the mucous membrane there is a layer composed of a tissue of a mixed character, containing some contractile fibres, supposed to be muscular, blended with elastic tissue. It is connected to the delicate tendinous covering of the corpus spongiosum, and is supported by transverse tendinous bands distinctly visible beneath it. This layer is thicker in the membranous than in other parts of the urethra. When examined with the microscope it presents abundant evidence of the existence of contractile fibre mixed with common elastic tissue. The bloodvessels from the spongy body shoot through it. According to Kölliker, the following is the arrangement of the submucous layer. It is termed by him the simple muscular tissue. Its relations are most complicated in the prostate gland and the prostatic portion of the urethra, which are rich in muscular fibres. So large is the quantity of the tissue in the gland itself, that the glandular structure constitutes scarcely one-third or the fourth of the whole. The longitudinal fibrous layer of the prostatic part is connected, internally, to the sphincter vesicæ, by a thin and indistinct layer of fibres with some of the longitudinal muscular fibres of the bladder, but by far the greater part of it is unconnected with the latter; it consists of half fibro-cellular tissue with many nucleus-fibres, and half of evident, smooth, muscular fibres with nuclei. After this, and external to it, follows, secondly, a strong layer of yellowish circular fibres of muscular and elastic tissue. On removing the several muscular layers, we come at last to the proper glandular tissue of the prostate, of which individual lobes penetrate among the circular fibres just mentioned, their excretory ducts passing through the longitudinal fibres.

“On laying open the urethra from its origin at the

neck of the bladder, the first structure we meet with is the caput gallinaginis, an elongated body situated on the floor of the prostatic part of the urethra ; it varies in length from three quarters of an inch to an inch. The caput gallinaginis divides the prostatic sinus into two lateral depressions, into which the secretion of the prostate gland is poured. At the most elevated portion of the caput gallinaginis is a depression formed by an inflexion of mucous membrane facing forwards, generally capable of admitting the blunt end of a common probe ; in some cases it can be traced down beneath the third lobe of the prostate to the extent of the third or even the half of an inch, it is called the sinus pocularis. On either side of this, between the laminae, or beneath it, are the terminations of the ejaculatory ducts."

The late interesting microscopical researches of Mr. Hancock have indisputably proved the muscularity of the urethra. Kölliker, of Wurtzburg, however, previously to Mr. Hancock's discovery, had, unknown to the latter, also noticed the involuntary muscular fibres of the urethra. In his published "Lettsomian Lectures for 1852," Mr. Hancock has described his own and Kölliker's share in the discovery of the muscularity of the urethra. Mr. Hancock introduces the subject by the following remark : "I would only observe that, whilst I willingly concede to Kölliker the priority of *noticing* these fibres, I claim for myself the credit of *describing* their situation and arrangement, and their importance as bearing upon practical points." After a statement of Kölliker's account of the muscularity of the urethra, Mr. Hancock gives us the following result of his own researches : "The organic muscular fibres in the prostate gland, connected with the urethra, are continuous

with those of the internal muscular coat of the bladder, whence they may be traced by careful examination, passing forwards through the prostate gland. These fibres, destined to invest the membranous and other portions of the urethra, appear to me to be entirely distinct from the organic muscular fibres found in large quantities throughout the gland, particularly around the sinus pocularis in the verumontanum or caput gallinaginis, where the principal excretory ducts of the gland, with the common ejaculatory ducts, open. Organic muscular fibres surround the various ducts which permeate the gland in all directions, and may, in the instance of the common ejaculatory ducts, be traced into the gland from the vas deferens, where they may readily be seen. The same arrangement obtains around the proper excretory ducts of the gland, and is beautifully shown where calculi are present in any quantity or size, in which case the foreign body may be seen impacted in the duct or cell with a circle of these organic fibres surrounding it. The muscular fibres are best seen in the prostate of a fœtus of between six and nine months, at which age the muscular fibres are very distinct, owing to the phosphatic deposits and fatty degeneration which takes place in the prostate gland at that period of life.

“The organic muscular fibres found generally throughout the prostate gland, belong, in a great measure, I believe, to the numerous vessels and ducts which ramify so freely through this body, as Mr. Guthrie has pointed out; and Mr. Quekett has proved the existence of muscular fibres in the coats of arteries; but these general fibres are, as I have before observed, distinct from those derived from the inner layer of the muscular coat of the bladder, and which form a layer sur-

rounding the prostatic portion of the urethra, separated from it merely by elastic and non-elastic areolar tissue. (Kölliker says these fibres, for the most part, have no connexion with the muscles of the bladder.) The outer layer of the muscular coat of the bladder, on the contrary, 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 pubis 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,' and which had previously been considered by Mr. Guthrie, as surrounded by a peculiarly dense structure, analogous to that which forms

the edge of the eyelid, and which he believed was requisite to maintain the patency of the opening ; so that not only have we the urethra supplied by a coat of organic or involuntary muscular fibre, but the spongy body itself lies between its two layers of involuntary muscle ; an arrangement, doubtless, of very great importance in relation to the due performance of the functions of the part. And, as regards the urethra, this arrangement holds good wherever we find the spongy tissue, whether the quantity of that tissue be small or great ; for, at the glans, which is formed not only by increased development, but also by a folding back, as it were, of the corpus spongiosum upon the corpora cavernosa, we have these muscular layers multiplied, whilst, on the upper surface of the urethra, where there is merely a narrow portion of corpus spongiosum, the same arrangement holds good. Independent of these layers of organic muscular tissue, nucleated fibres may be found distributed occasionally throughout the spongy tissue, but I think they belong more properly to the arteries of the part."

With regard to the muscularity of the prostate, Mr. Hancock observes : "I knew that the muscularity of the prostate gland had been hinted at, but I was not aware until I spoke to Mr. Quekett upon the matter, that, although he had not published, he had some years previously established the fact, but had not pursued the matter farther. Therefore, as regards the prostate gland, the credit of priority is due to that gentleman."

CHAPTER III.

VARIETIES OF STRICTURE.

STRICTURES of the urethra, for practical purposes, may be classed under the following heads :—1. Dilatable stricture. 2. Simple chronic stricture. 3. Impassable stricture. 4. Irritable stricture. 5. Inflammatory stricture. 6. Stricture with marked disposition to contraction. 7. Spasmodic stricture. 8. Stricture from external or internal mechanical injury. 9. Stricture from ulceration of the external urethral orifice. The nature of the first, the dilatable stricture, has been previously explained.

2. SIMPLE CHRONIC STRICTURE.—In the dilatable stricture, it will be recollected that the elasticity of the urethra is slightly impaired in some part of its course from chronic inflammation, a small quantity of lymph having probably been effused. In the stricture now under consideration the mischief has gone farther, and more or less alteration of structure has taken place ; the parietes of the urethra having become thickened at the seat of disease. It must, consequently, be expected that the cure of such a stricture will not be so readily effected as in the first species, as the necessary absorp-

tion or removal of the thickened tissue in the second renders the curative process more protracted.

3. IMPASSABLE STRICTURE.—When a stricture is impervious to instruments, it is called impassable or impermeable. The obstruction may be so complete as entirely to prevent the passage of urine through the urethra, in which case, for the preservation of life, either nature or art must effect an outlet for its escape. The obstruction, however, in these strictures is seldom so complete as to prevent the urine trickling through them, and passing partly, if not entirely, by its natural channel, either in drops, or in a very small thread-like stream.

4. IRRITABLE STRICTURE.—This stricture is highly sensitive, the introduction of a bougie causing unusually severe pain, and is generally, but not always, disposed to bleed when an instrument is passed through it. The urine when passing over a stricture of this kind frequently causes a sensation of heat or scalding, sometimes so painful that the patient dreads the act of micturition. Rigors are apt to occur occasionally, especially after the introduction of instruments. Irritable strictures are usually observed either in persons whose digestive organs are unhealthy, in those whose general health has been impaired by residence in warm climates, or in such as have been accustomed to much indulgence in the pleasures of the table, by which a high degree of excitability of the nervous system has been produced. In the poorer classes of society, the irritability is most frequently brought on by the excessive use of ardent spirits. An irritable stricture, if under the influence of muscular action, is predisposed to spasm; and, if in a situation of the urethra not surrounded by muscles, the irritation caused by the pres-

sure of an instrument often causes such a distension of the vessels of the corpus spongiosum around the obstruction, and of the lining membrane at the seat of disease, as frequently, for a short time, to obstruct entirely the passage of the urine.

I believe that irritability of a stricture depends more frequently upon constitutional peculiarity than on inflammation of its lining membrane. That peculiar temperament in which the nervous system is morbidly sensitive, somewhat similar to the hysteric, is the one in which strictures, when they occur, are most likely to become irritable. It will readily be conceived that in such constitutions, the nerves, at the seat of disease, may be extraordinarily sensitive on pressure, or other irritation, independently of inflammation.

5. INFLAMMATORY STRICTURE.—By this term is understood a stricture caused by acute inflammation of some part of the urethra, most frequently from the extension of gonorrhœal inflammation to the posterior part of the urinary canal, inducing a swollen state of its lining membrane, generally with more or less spasm of the surrounding muscles. The same phenomena may, however, be produced by other causes, as external or internal injury.

6. STRICTURE WITH MARKED DISPOSITION TO CONTRACTION.—There are some strictures which are sure to return if left to themselves, although a full-sized instrument has been passed into the bladder; and there are others which do not admit of being dilated to the size of the healthy urethra, that are more especially liable to re-contraction. Such strictures are in general hard, and often extensive. In this form of urethral obstruction, the patient must, of course, make up his mind

to submit to the trivial inconvenience of the regular introduction of instruments.

7. SPASMODIC STRICTURE.—This term should, I think, be restricted to an obstruction from involuntary contraction of the muscles surrounding the bulbous or membranous portion of the urethra. By many persons, however, it has been supposed that spasmodic stricture may occur in any part of the urinary canal. This supposition appears to have arisen from the circumstance of a bougie having been grasped by obstructions situated anterior to the bulb. The muscular fibres, which, by the aid of the microscope, have lately been discovered by Hancock and Kölliker, and which have been traced by the latter traversing the whole course of the urethra, are so exceedingly minute, that I can scarcely imagine them capable of exerting the power to grasp a bougie, which is occasionally experienced in obstructions anterior to the *acceleratores urinæ* muscles and those of Wilson and Guthrie. It is certainly no uncommon occurrence in irritable urethræ, for instruments to be obstructed in different portions of the canal anterior to the perineal muscles, where there is no permanent thickening at the seat of obstruction. But, in such cases, it will, I believe, be found that there is more or less morbid sensibility of the urethral membrane at the part where the instrument meets with obstruction. When an instrument is pressed against the particular portion of the lining membrane at the seat of obstruction, considerable irritation ensues, and consequently an increased afflux of blood to the affected part; but it is possible that the muscles lately demonstrated by Mr. Hancock may have some little share in causing the obstruction.

I believe, however, that the obstruction to, or grasping of, an instrument, under the circumstances just mentioned, is caused, in a great degree, by the unyielding nature of the elastic tissue of the urethra, which participates in the irritability of the lining membrane of the canal. I do not think the exceedingly minute muscular fibres surrounding the urethra are capable of exerting any more powerful effect upon an instrument than that suction-like, or clinging action, which is so frequently experienced on withdrawing a bougie from an irritable urethra, when these little muscles, it may be presumed, must be peculiarly predisposed to contraction; a very different sensation, however, to that of the firm grasp of a spasmodic stricture.

That a morbid sensibility, and that often of no slight degree, generally exists at the spot where the bougie is obstructed, is evident from the increased pain caused by the bougie at that particular part, and from the relief usually afforded by a gentle application of caustic to the lining membrane at the seat of contraction. Mr. Hancock, indeed, informs us, that in a case of spasmodic contraction, at about three quarters of an inch from the urethral orifice, "At first, the pain produced by any attempt to pass the spasmodic contraction was so excessive that the patient roared with agony, and there was no managing him but by applying caustic once or twice. This has been allayed, and we now get on very well." I think that the muscles described by Mr. Hancock are not sufficiently powerful to account for the occurrence of these contractions, and that they must at all events, be partly caused by the increased flow of blood to the seat of irritation, which distends the vessels of the corpus spongiosum around the obstruction, and, consequently, tightens the grasp upon an instrument;

but more particularly by the irritable, unyielding state of the elastic tissue of the canal. The cases in which instruments are grasped anterior to the perineal muscles when no permanent stricture exists, are usually observed in persons of high nervous excitability, or in such as are affected with a slight form of congestive urethritis, in which, on inspection of the urethral orifice, an increased redness and slightly swollen state of the mucous membrane will be found, with, probably, an increased moisture causing an agglutination of the meatus in the morning.

Even when instruments are grasped by permanent strictures anterior to the perineal muscles, the sensation is very different to the firm, vice-like clutch, so frequently experienced in obstructions at the bulb, and membranous portion of the urethra. Indeed, in those parts, the spasmodic action of the perineal muscles upon the instrument, can often be distinctly felt both by the surgeon and the patient. I think, therefore, that the term spasmodic stricture should be confined to temporary obstructions occurring in that portion of the urethra which is surrounded by the perineal muscles.

We have, in general, sufficient evidence of the existence of inflammation of the lining membrane of the urethra; or, at all events, of extreme morbid sensibility, from the increased pain experienced by the patient on the passage of an instrument through the affected part. That inflammation is very often the cause of these obstructions is proved by their liability to terminate in permanent stricture. The muscular contraction constituting spasmodic stricture seems mostly to result from the irritation caused by the urine passing over the inflamed or morbidly sensitive lining membrane at the seat of obstruction; it may

arise from causes not within the urethra, that canal being affected by its sympathy with neighbouring parts, as is sometimes exemplified in inflamed piles, or from the application of a ligature to those tumours. I cannot but think that a purely spasmodic stricture of the urethra, unless from sympathy with irritation of neighbouring parts, is comparatively of rare occurrence. It is not difficult to account for spasm in the inflamed state of the lining membrane of the urethra ; but, when healthy, it cannot be supposed that the urine will often prove so highly stimulating as to excite spasmodic action of that canal, frequently of many hours' continuance. That spasm of the muscle embracing the membranous portion of the urethra, may possibly sometimes occur from long-continued efforts in resisting the desire for the expulsion of the urine, seems to be a more probable supposition. It is also very probable that some peculiar derangement of the nervous system, of the nature of which we are unacquainted, may occasionally interrupt that sympathetic consent described by Sir C. Bell, as existing between the muscles surrounding the urethra, and those concerned in the contraction of the bladder, by which the former relax whilst the latter contract ; and which was compared by him to the well-know connexion between flexors and extensors.

Spasmodic stricture ought to be regarded as, generally, the result of inflammation of the lining membrane at the bulbous, or membranous, portion of the urethra, causing so much irritation, especially when the urine passes over the inflamed part, as to excite contraction of the surrounding muscles, so that their necessary relaxation on the contraction of the detrusor is prevented. These inflammatory spasmodic strictures most frequently occur in persons with a disordered state of the digestive organs ; or

who indulge in some excess or other ; or they may arise from the sudden suppression of gonorrhœal discharge. In the latter case, the gonorrhœal inflammation, from cold or other causes, rapidly extends to the bulbous and membranous portions of the urethra, and excites so much spasmodic action of the surrounding muscles as often to cause complete retention of urine ; or the same effect may arise from the sudden increase of pre-existing inflammation in those parts. All permanent strictures at the bulb and membranous portion of the urethra may be increased by spasmodic action, arising from various causes exciting irritation, such as the passage of instruments, the injurious indulgence in fermented liquors, from cold, and from the urine containing the lithites in excess, which is often the source of spasmodic urethral irritation in gouty subjects. A stricture partly permanent and partly spasmodic, has been commonly called a "mixed stricture." The spasmodic is readily distinguished from the permanent stricture, for in the former, the stream of urine is only occasionally diminished, whilst in the latter, it is always smaller than natural.

8. STRICTURE FROM MECHANICAL INJURY TO THE URETHRA—TRAUMATIC STRICTURE.—The urethra is occasionally injured from within by instruments, by calculi or their fragments, after lithotrity, lacerating the lining membrane, which injury sometimes causes stricture. The urethra may be torn across, or ruptured from without by blows upon the perineum, as from a person, when on horseback, being forcibly thrown forwards upon the pommel of the saddle. Sometimes the external parts are divided as well as the urethra ; but the latter may be torn without any wound, or even appearance of injury of the external parts. From the resistance

opposed by the arch of the pubes, the urethra is peculiarly liable to be injured at that part by any violent blow upon the perineum, but the canal may be lacerated in any part of its course by the passage of sharp fragments of calculi. The urethra may be severely bruised or lacerated by fractures of some of the pelvic bones, especially the ischia; or from a separation or loosening of the symphysis pubis. Stricture of the very worst kind may result from severe blows upon the perineum. Blood, followed by a little urine, probably escapes from the lacerated urethra, abscess, and more or less sloughing ensues, leaving a hard cicatrix, which partially or completely obstructs the passage of the urine, which passes in part or entirely through a fistulous orifice, or orifices in the perineum.

Some strictures so readily bleed, even on the most careful introduction of instruments, that the term hæmorrhagic might, without impropriety, be applied to them. In extreme cases of this character it is not improbable that the lining membrane at the seat of disease is somewhat similar to the villous congestive state of the internal coat of the eyelids, known as granular conjunctiva, or of some kinds of hæmorrhoidal excrescences. In support of such a view I may observe that the application of caustic potash very soon removes all hæmorrhagic disposition. The inflammatory stricture, as might be expected, is usually much disposed to bleed on pressure by the bougie; as is also the irritable, the lining membrane of the latter being commonly in a state of sub-acute inflammation or congestion. The irritable stricture has not, however, always this hæmorrhagic disposition; for one of the most irritable strictures I ever met with did not at any time bleed on the introduction of an instrument.

9. STRICTURE FROM ULCERATION OF THE EXTERNAL URETHRAL ORIFICE.—This is a variety of urethral obstruction which usually occurs from syphilitic ulceration of the meatus, destroying a part, or the entire circumference, of the glans ; the cicatrization of the ulcer causing more or less contraction of the part, which has a strong tendency gradually to increase, until the outlet for the urine may possibly become so minute as to admit with difficulty the introduction of a small probe.

CHAPTER IV.

SYMPTOMS OF STRICTURE.

As might be expected, the early signs of stricture are seldom sufficiently marked to attract attention; and the disease has commonly made considerable progress before it is discovered. A slight contraction of the urinary canal, unless in an irritable urethra, will cause but little impediment to the discharge of urine; and a stricture is not often suspected until some difficulty in micturition is experienced. The first symptom that will, probably, be noticed by a person affected with stricture, is, that he experiences some little difficulty in starting the urine; and that, instead of being passed, as formerly, immediately on the contraction of the bladder, more or less effort will be required at the commencement of micturition. He will also find that his urine is not voided in so full a stream as formerly, the act of micturition occupying a longer time; he will probably next observe the escape of a few drops of urine after that act has been apparently completed. The part of the urethra immediately behind the obstruction, in many cases, becoming dilated, forms a reservoir for the collection of urine, which is not affected

by the contraction of the bladder, but gradually trickles away afterwards through the stricture. The same trickling may happen when no dilatation exists behind the obstruction, from the greater difficulty with which the last few drops of urine are urged forward through the contracted passage than is the case with a larger quantity of fluid. As the contraction increases, the stream of urine is either bifurcated, spiral, or scattered, until at length it becomes exceedingly small and thread-like, at times issuing only by drops. These different appearances all arise from the urethra being incompletely filled by the urine, which, when it reaches the orifice of the canal in an unequally diffused stream, must necessarily be either divided, or, if entire, very minute or spiral. It is at length found that the necessity of emptying the bladder becomes more frequent during the day, and the patient is probably obliged to rise two or three times in the night for that purpose. When the stricture has become very contracted, the urine is voided with great difficulty, either by drops, or in a thread-like stream, with much straining; and the abdominal muscles are excited to powerful action. The penis frequently becomes much swollen from distension of its bloodvessels, being in a state of partial erection during micturition. The irritation sometimes extends from the stricture to the rectum, and the patient has often added to his miseries, both prolapsus ani and hæmorrhoids.

A gleety discharge is a very common symptom of stricture. This discharge is often but slight, a few yellowish spots being occasionally observed upon the linen. Sometimes the discharge occurs only after coition, and is often so profuse as to resemble a gonorrhœa, for which it is frequently mistaken by the patient. It

is usually, however, attended with but little scalding, and ceases naturally in the course of a few days. The discharge may be brought on or aggravated by cold or intemperance. Diarrhœa is, also, an occasional consequence of bad strictures, apparently from irritation, extending by sympathy to the mucous membrane of the large intestines. Pains are often felt in the lumbar and inguinal regions, with more or less aching in the perineum. In many cases of permanent stricture this perineal pain frequently extends down the left thigh. Why it should affect the left oftener than the right, no satisfactory reason can be assigned; but the fact has been noticed by several writers on stricture. In bad cases, sterility is sometimes induced from obstruction to the seminal fluid; and impotence may result from irritation extending to the prostatic part of the urethra, causing spermatorrhœa. The seminal emission in such cases is often attended with acute pain. The prostate gland, as well as its ducts, sometimes become inflamed and enlarged. The inflammation of the prostate may terminate in suppuration, the abscess being sometimes burst by the introduction of the bougie, indicated by a free discharge of pus from the urethra. The sufferings of the patient are often much aggravated by an extension of the urethral inflammation to the neck of the bladder, causing an urgent and almost incessant desire to micturate. From the diminution of the stream of urine being so very gradual and imperceptible, the presence of a stricture is often unsuspected, until some indiscretion of the patient, causing inflammation of the diseased part, increases the urethral obstruction, and induces more or less difficulty in micturition. In aggravated cases, as has been previously stated, a vitiated mucus is secreted from the urethra posterior to the

stricture, the whole of the lining membrane of the urinary organs, in some instances, participating in the secretion. This secretion is the effect of irritation and inflammation of the mucous membrane of the urinary organs, and takes place in other diseases of those parts as well as in cases of stricture, especially in vesical calculus, and enlarged prostate.

It is extremely desirable that the existence of a stricture should be ascertained as soon as possible. If a person be subject to a gleet discharge, whether occasional or constant, the urethra should be examined without much loss of time. An urethral examination should also be made when the urine is passed more frequently than ordinary; or if pain be felt in the perineum after micturition. Persons with urethral stricture are sometimes subject to occasional attacks of inflammation of the testes. If, therefore, such inflammation occur, and there be no other obvious cause, a bougie should be passed.

It must not be forgotten that the urine may be voided in a very good stream when a stricture will admit, with difficulty, the introduction of a middle-sized bougie; and, in some instances, when the contraction is even greater. In such cases, the increased muscular power acquired by the bladder enables it to overcome, in a great degree, the urethral obstruction. It must also be borne in mind that much depends upon the state of the stricture itself, for if the elasticity of the obstructed portion of the canal be but slightly impaired, it may yield sufficiently to the increased power of the bladder to enable the patient to void his urine in a larger stream than might be supposed from the size of the bougie which can be passed. It is only when a stricture is rigid and unyielding that the size of the stream of

urine can be depended upon as affording correct information of the extent of urethral obstruction which exists. It should be recollected that the muscular power of the bladder is greater during youth and the vigour of manhood than in old age, so that with the same degree of urethral contraction we may expect the urine to be passed more freely in the former than in the latter period. Although, therefore, a patient when young, or in the prime of life, may void his urine in a good sized stream, if he be longer than usual in the act, his urethra should be examined as soon as practicable.

Rigors, except from the introduction of instruments, are not commonly experienced in this country by those affected with stricture; but in warm climates, from the greater irritability of the nervous system, the constitutional sympathy with the local disease is often indicated by paroxysms of intermittent fever. In some peculiarly irritable constitutions, however, rigors are occasionally observed, even in this country, as symptomatic of stricture, and the disease has been mistaken for ague, the urethral affection having been entirely overlooked. In some persons the constitution so readily sympathises with urethral irritation, that rigors are apt to occur from the introduction of instruments. These rigors, when severe, are followed by increased heat of skin, and more or less perspiration. Rigors also occur when an abscess has formed from irritation of the urethra, or after extravasation of urine.

When a stricture has become rigid and narrow, the difficulty in micturition is often very great; the bladder is irritable, usually much contracted, and incapable of containing more than three or four ounces of urine. In aggravated cases the urine is passed every hour, or

oftener, during the day, either by drops, or in a thread-like stream, which occasionally stops, and the patient is obliged to assist its passage by extending his penis, and so producing a vacuum which facilitates the passage of the fluid. By this constant pulling of the penis, a kind of hypertrophy is sometimes induced, the organ being considerably swollen and elongated, whilst the prepuce is often infiltrated with serum. This enlargement of the penis, however, gradually subsides as the urine finds a freer passage by the dilatation of the stricture. When the hypertrophy has been considerable I have observed that virility has been impaired. The patient is often obliged to rise several times during the night to pass his urine, or it may dribble from him unconsciously during sleep. To add to his distress, attacks of complete retention of urine may occur.

The rectum often becomes irritable, the patient suffering much from tenesmus, whilst the sphincter muscle of the bowel may become so relaxed as to permit a portion of its contents to escape involuntarily during the powerful contractions of the abdominal muscles when straining. Piles and protrusion of the rectum are also likely to occur. The effects of a highly contracted stricture upon other parts of the urinary organs behind the obstruction have been previously described; and it will be recollected that disease of the kidneys may be added to that of the urethra and bladder.

An increased secretion of urine is very common in urethral stricture, especially in its more aggravated forms. The irritability which affects the bladder in such cases may attack the kidneys also, augmenting their secretion, in some instances very considerably; and I have known sixty ounces of urine to have been passed in the course of twelve hours. This renal irritability,

however, to any great extent, is seldom of long duration, the attack soon passing off, although in old irritable strictures the secretion of urine is usually beyond its healthy proportion.

Incontinence of urine is one of the most annoying accompaniments of bad strictures, the patient being sometimes troubled with a more or less constant dribbling day and night. The incontinence may, however, be but slight, and of little consequence, resulting from a small quantity of urine remaining in the dilated part of the urethra behind the obstruction, and which gradually trickles away after the apparent termination of the act of micturition. This symptom may remain for some length of time after a stricture has been completely dilated, the pouched state of the urethra continuing after removal of the obstruction from which it originated and probably never entirely disappearing during the patient's life. In some instances, however, the continuance of this symptom after dilatation of a stricture depends upon the diseased portion of the urethra not having sufficiently recovered its healthy elasticity, so that it still forms an obstruction to the passage of the last few drops of urine, which will not, of course, be so forcibly propelled forward as a larger quantity.

In other cases, the incontinence is much more serious, and often causes mental depression. It is usually observed in strictures of an aggravated kind, in which the urine is passed with great difficulty. In these cases, the bladder is scarcely ever half emptied at any one time, and, from its urgent straining efforts, the elastic tissue surrounding the vesical orifice of the urethra, as well as the compressor urethræ muscle, become so much weakened as frequently to permit the escape of a

little urine, especially on any impulsive action of the abdominal muscles, as in coughing. In some of these cases, the patient is so harassed night and day with this dribbling of urine (which is often very fetid), that his linen is kept constantly wet, and he may thus become an object so offensive as to be obliged entirely to exclude himself from society.

Involuntary seminal emissions, when present, add in no slight degree to the mental depression, which, more or less, is a too frequent accompaniment of urethral obstructions.

Notwithstanding the catalogue of a patient's miseries with a bad stricture may be long and fearful, let him console himself with the assurance, that they will all of them, most probably, eventually disappear, after removal of the urethral obstruction. A bladder that at one time would scarcely contain three or four ounces of urine, will usually be found gradually to recover its retentive power as the stricture is opened, and when the contraction is fully dilated, may be capable of containing from eight to twelve ounces of urine. There is every reason to suppose that the muscular coat of the bladder becomes thinner when the necessity for its increased action ceases.

It may be as well to notice that the symptoms of strictures in general are mostly aggravated in cold weather, especially such as are predisposed to spasm. For example, a person suffering from stricture will probably be unable to pass his urine whilst exposed to a low temperature in the open air, although, on his return to a warm apartment, he may soon, under its influence, recover the power of micturition.

CHAPTER V.

DIRECTIONS FOR THE INTRODUCTION OF INSTRUMENTS IN
THE TREATMENT OF URETHRAL OBSTRUCTIONS.

THE patient may either stand before the surgeon or be placed in a recumbent position. On the first examination it will be prudent to select the latter, as more or less faintness is frequently experienced by persons on the first introduction of an instrument. I generally, however, prefer, probably from habit, the erect position, whenever it can be prudently adopted. The end of the penis should be supported between the fore and middle fingers of the left hand, whilst the thumb is placed immediately before the latter, on the lower part of the glans, by which means will be best obtained that perfect control over the urethra, so requisite in the introduction of instruments. The handle of the sound or catheter being turned towards the patient's left groin, and held, like a writing-pen, lightly between the two first fingers and thumb of the right hand, or between the thumb and index finger, the point of the instrument should then be introduced into the urethra, and gradually passed forward, whilst, at the same time, the penis is gently extended. As the sound

glides along the urethra, the right hand must be gradually raised and brought within two or three inches of the patient's abdomen, with the instrument in a perpendicular position. The point of the sound should now be gently pressed forward under the arch of the pubis, along the upper part of the urethra, as far as it will go without much resistance, whilst, at the same time, the penis is put upon the stretch; the handle of the instrument must now be depressed until its point has entered the bladder, which, in all probability it will readily do, if the urinary passage be free from abnormal obstruction. If, however, the instrument should not enter the bladder, it is most probably pressing against the under surface of the triangular ligament, in which case its point should be withdrawn for an inch, and then again passed onward with the same precautions as before. The natural obstacles in the urethra are readily surmounted by careful manipulation. The lacuna magna will be easily avoided by keeping the point of the sound to the lower surface of the urethra for about two inches' length; but, afterwards, during its whole course, the end of the instrument should be kept well to the upper part of the canal, as the greater number of lacunæ are situated inferiorly.

After having got beyond the lacuna magna, the instrument will pass on with facility to the commencement of the bulbous portion of the urethra, where it becomes a little narrower, which slight contraction is often distinctly to be felt; but the part most likely to cause obstruction, if care be not taken to avoid it, is the triangular ligament which passes under the urethra; for, unless the end of whatever instrument we may use be kept to the upper part of the canal, it is apt to sink

into the sinus of the bulb ; and should the handle be then depressed, its point will catch against the inferior surface of the ligament, where most false passages have been made. The error may, in general, be easily avoided, especially with a solid curved instrument ; for as soon as this has passed the pendulous portion of the canal, it is only necessary to keep its well-rounded point steadily along the upper part of the passage, whilst the urethra is at the same time put upon the stretch, by which means the triangular ligament will seldom offer any difficulty.

After the sound or catheter has passed the triangular ligament, the point of either may possibly be prevented from entering the bladder by a slight projection of the prostate, or by the ligamentous band at the vesical commencement of the urethra ; but by well depressing the handle of the instrument employed, the obstacle is usually surmounted with facility. When a narrow stricture has long existed at the bulb, or commencement of the membranous portion of the urethra, the part of the canal behind the obstruction may become much dilated, forming a depressed pouch below the orifice of the bladder, so that the point of an instrument is apt to catch against the vesical entrance. This pouch is best avoided by using an instrument with a larger curve than ordinary. In passing a straight instrument, the penis must be raised and gently extended, and then no impediment should be experienced until it reaches the middle or transverse portion of the prostate, when its point is to be well raised by depressing the hand ; but to enable it to ride over the obstruction the assistance of the finger in the rectum may sometimes be required.

Before examining a person supposed to have a stric-

tured urethra, he should be desired to pass his urine, that the size of the stream may be ascertained, which will usually afford a tolerably correct idea of the calibre of the canal. If the stream of urine be not greatly diminished, a plaster bougie of the size of the orifice of the urethra should be selected, which can be warmed by drawing it a few times through the hand, and then properly curved to the shape of the urethra. It is, I believe, a very general plan to select for the first examination a bougie of the size of the stream of urine passed by the patient ; but as this may be more or less affected by spasm, especially in an irritable urethra, it will be best to use an instrument which will just enter the urethral orifice. By this means the slightest stricture will be at once detected, and a smaller bougie of the proper size can afterwards be introduced. If the symptoms of stricture be well marked, and the bougie meet with obstruction, there will then be but little doubt of the presence of stricture. If, however, the patient says he sometimes voids his urine in a good stream, the surgeon should never rest satisfied merely with the introduction of the bougie, but should also examine the urethra with a full-sized metallic sound. Indeed this procedure is highly desirable in all cases where the contraction is not great, as it will frequently prevent an erroneous opinion being formed of the existence of a permanent stricture, for a solid metallic instrument will often pass when the plaster bougie cannot readily be introduced, as the latter may have either lost its proper curve, become entangled in one of the lacunæ, or it may have been arrested by spasm.

If there be a stricture, the bougie will probably be stopped either at the commencement of the bulb, or at its junction with the membranous portion of the urethra,

although, as previously observed, an obstruction may exist in any part of the urinary canal. If the bougie first used should be so obstructed that it cannot easily be passed onward, the size must be decreased until one be selected that will pass through the stricture, supposing it to be an obstruction permeable by instruments. The bougie, catheter, or sound, should be very slowly introduced, and withdrawn by an almost imperceptible movement of the hand, as causing much less uneasiness to the patient than a more quick and legerdemain method of proceeding, and, except from the occurrence of sudden faintness, rapidity cannot be required in such cases. The bougie, especially if a small one, may appear to have entered the bladder, when, in reality, it has not passed the stricture; but the mistake is discovered when the instrument is withdrawn, for it will either be doubled upon itself, or twisted like a corkscrew. When introducing a bougie it will be well to bear in mind that the opening of a stricture is not always in its centre; and that it may be necessary to vary the direction of the point of the instrument. If a patient should become faint when an instrument is passed in the erect position, he should be immediately laid down upon some chairs or a sofa.

Bougies, or other dilating instruments, appear to act beneficially upon a stricture: firstly, by enlarging the passage through it, consequently diminishing the irritation caused by the pressure of the urine; secondly, by lessening the morbid sensibility, inflammation, or congestion of the lining membrane at the seat of disease; thirdly, by effecting absorption of the morbid tissue. These effects, with the exception of the latter, appear evident from the successive introduction of the bougie usually causing less pain than when the instrument is

first passed ; and by the gradual restoration of the urethra to its healthy calibre. Surely the circumstance of the pain becoming less on each succeeding introduction of the bougie, tells against the supposition that it is by causing inflammatory softening and subsequent absorption of the stricture its good effects are produced. I cannot but think that whenever inflammation of a stricture is either caused or increased by the introduction of dilating instruments, but little good is effected by them ; and that such inflammation oftener retards than advances the patient's progress towards recovery. The lining membrane at the seat of stricture being usually in a state of congestion or chronic inflammation, it might naturally be expected that gentle pressure would afford relief, from the well-known good effects of compression in other parts similarly affected.

It is doubtless true, that parts recently formed from disease are more readily absorbed than the healthy tissues of the body. It may, however, be questioned whether the semi-cartilaginous tissue of old gristly strictures be capable of removal by the absorbents ; at all events, the almost certain return of such contractions, unless their dilatation be preserved by the constant introduction of dilating instruments, proves that their absorption is exceedingly difficult. My belief is, that in the majority of strictures of long standing, the action of the bougie is almost entirely mechanical, and not vital, causing their absorption ; for then, the disease having been removed, there would not be that strong tendency to re-contraction which is admitted by every one conversant with the subject.

Model-bougies are sometimes used to take an impression of the face of a stricture when there is difficulty in finding its opening. The model-bougie has its

point made of softer composition than the shaft. A bougie of middle size is commonly used, and, being well oiled, is passed down to the obstruction against which it is steadily pressed for about two minutes. When withdrawn there will be one or more projections at the end of the bougie indicating the beginning of the true, and probably, of one or more false passages, should such exist. When there are two or more projections, it is most probable that the upper indicates the true, and the lower one the false, channel, which is usually made in that direction.

In the admirable treatise on "The Diseases of the Urinary Organs," by Dr. Gross, Professor of Surgery in the Louisville University, which I have read with much pleasure as well as instruction, it is stated that Professor Bigelow, of Harvard University, has lately recommended the use of gutta percha bougies for taking an impression of strictures. He uses a middle-sized bougie of that material, well oiled, first passing it to and fro in the edge of the flame of a candle until it is warm enough to be impressed by the finger-nail. The bougie is then to be passed quickly down to the stricture, against which it is to be pressed for a minute with a force equivalent to the weight of one or two ounces, and then left in the part triple that space of time to cool, when, being slowly withdrawn, it will present an exact representation of the inequalities of the face of the obstruction. The gutta percha should be pure, and no warm water employed in its preparation, otherwise the steam given off by it is apt to soften the bougie for several inches, causing it sometimes to curl up against the stricture. I have tried this kind of model-bougie, and found it to answer its purpose remarkably well.

The common method of fixing a catheter in the

bladder is by placing a bandage round the waist, to the middle of which is attached a longitudinal band divided up its middle, one end passing on each side between the patient's thighs and scrotum; to these the catheter is secured by tapes passed through the rings of the instrument.

A very simple method for retaining an instrument in the bladder is recommended by Mr. Guthrie. "The catheter," he observes, "which need rarely exceed eight inches, should have a silver extremity, to which two rings are affixed, and to each of which a piece of strong bobbin, ten inches long, is to be attached. The catheter, being introduced to the proper distance, the two pieces of bobbin are to be carried backward along the sides of the penis as far as the pubes, a narrow stick of sticking-plaster is then to be bound round the middle of the penis, and over them, so as to keep them fairly to it. The ends of the bobbin are then to be turned forwards to the outside of the plaster, when they may be tied together on the end of the catheter, which is steadily fixed in its place, subject to any motion of the part generally with which it moves as a whole." In concluding this subject let me earnestly recommend the surgical student never to omit any proper opportunity for the introduction of instruments into the bladder either in the dead or the living. Let him not in his admiration of the more brilliant operations of surgery, neglect the less showy ones, required in the treatment of diseases of the urethra and bladder. Let him remember that the former are rarely required in comparison with the latter. I can assure those who regard, as of slight importance, the apparently trivial operation of passing a bougie or catheter, that there are few instruments which have been productive of greater mischief

in unskilful hands, and that dexterity in their use is as requisite as in any part of operative surgery. The following quotations will surely be sufficient to convince the student of the importance of the advice here given :

“The operation of introducing a catheter through what has been called an impermeable stricture, is, without doubt, the most difficult in the whole range of surgical operations, and requires all the prudence, science, and skill of a master.”—*Liston's Operative Surgery*.

“The introduction of the catheter, although apparently very simple, is one of the nicest and most delicate processes in surgery. It requires skill of the highest order, as well as the most intimate knowledge of the anatomy of the urinary organs. If I were called upon to state what I considered as the most important operation that a practitioner is obliged to perform, I should unhesitatingly say, the introduction of the catheter. It is true, the most untutored and awkward surgeon may occasionally, nay, perhaps, not unfrequently does, reach the bladder without difficulty ; but let such an individual attempt the passage of the instrument when there is some mechanical obstacle, as a stricture or an enlarged prostate, and he will be sure to be foiled.”—*Gross on “Diseases and Injuries of the Urinary Bladder, the Prostate Gland, and the Urethra.”*

CHAPTER VI.

TREATMENT OF STRICTURES OF THE URETHRA BY
DILATATION.

THERE are probably few diseases that require greater skill and judgment in their management than obstructions of the male urethra. There are none, I believe, in which more mischief is done by rough handling, much gentleness and care being essential for their successful treatment. In its diseased state the urethra often becomes highly sensitive, and should the introduction of instruments be then required, it is evident that lightness of hand and delicacy of touch are very necessary qualifications in the surgeon who has to use them.

For the successful treatment of its diseases, the urethra must be viewed, not merely in relation to its morbid anatomy, but also physiologically. The extreme delicacy of its lining membrane, and great vascularity of the subjacent textures, as well as the constitutional sympathies often excited if it be roughly handled, must all be carefully considered. The urethra should, in fact, be regarded as an extremely sensitive canal, endowed with a high degree of vitality, and not treated

mechanically as an inert channel in which holes can be drilled or obstructions broken down with impunity. With this view of the subject, when introducing instruments into the urethra, the surgeon will constantly bear in mind that by art, not force, his object is to be accomplished ; consequently, in all his proceedings, extreme gentleness and caution are observed. Notwithstanding the best rules that can be given for his guidance, as manual dexterity can only be acquired by practice, the young surgeon will see the necessity of availing himself of every legitimate opportunity in the living subject for the introduction of instruments into the bladder. Although stricture of the urethra, when properly treated, in its early stage, is, comparatively, of slight importance, in its more advanced state, when, in fact, professional aid is usually required, it is frequently a source of great misery to the unfortunate sufferer, rendering his life truly wretched, and taxing to the utmost the skill, patience, as well as perseverance of the surgeon.

Permanent stricture of the urethra is essentially a surgical disease ; for, although medicine may do much to mitigate suffering, by improving the general health when impaired, by allaying irritation, and by keeping the urine, which should be frequently tested, in as healthy a state as possible, the cure of the complaint can only be effected by the manipulations of the surgeon.

The means adopted for the removal of strictures of the urethra are—1st. Dilatation. 2ndly. The application of caustic. 3rdly. Division of the stricture, either from within by the lancetted catheter, or from without by perineal incision.

The treatment by dilatation is the most simple method of proceeding, and the one to be preferred

where it is found to answer ; it is that which is usually adopted, and when carefully conducted causes but little pain or irritation. The instruments commonly used for effecting dilatation are plaster and metallic bougies, gum elastic, and silver catheters.

Many surgeons have their favourite instruments for dilating strictures, some giving a preference to the silver catheter, others to the solid metallic sound, whilst the elastic gum and plaster bougies have also their advocates.

BOUGIES.—Bougies are of various kinds, some being composed of wax, some of plaster, some of elastic gum, and others of catgut. Wax bougies are the softest, and are now chiefly used to take a cast or impression of the face of a stricture. Plaster bougies are of much firmer consistence, and, when properly made, may be very advantageously employed in many cases. The elastic bougie is a favourite instrument with many practitioners, and is much used in France, as is also the conical bougie, which gradually tapers from within an inch or two of its point. I very rarely use the former, as its extreme flexibility renders it difficult to know where the point of the instrument is pressing. The latter has always appeared to me objectionable ; for, unless of very small size, should it meet with obstruction in passing along the urethra, it will be almost impossible to know whether the point of the bougie, or its increasing diameter, constitute the impediment to its advance. The catgut bougie is principally useful in cases of retention of urine. Solid instruments, made of flexible metal, called metallic bougies, are sometimes used ; they appear to me, however, to be very inferior to those made of steel or silver, being likely to lose their proper curve by bending ; nor have they apparently

any particular quality to recommend them in preference to others of greater firmness.

CATHETERS AND SOUNDS.—The gum elastic catheter is a most useful instrument, and often proves of very great value in the treatment of stricture. Gum catheters should be kept of their proper curve by a stilet; and they may be used with or without it, as occasion may require. Steel sounds, plated with silver to preserve them from rust, with a moderate curve, when the urethra will bear them without irritation, are in general to be preferred to all other instruments in effecting dilatation; indeed, in old hard strictures they are frequently the only efficient dilators. A solid silver sound is, of course, equally efficient, but is not so generally used. Silver catheters are also very useful, especially when a stricture has been for some time impervious; for should the surgeon succeed in passing a small one into the bladder, it can be retained as long as advisable; its retention, in some instances, proving very advantageous to the patient. In strictures which have long been impermeable, if successful in the introduction of a small silver catheter, the urine flowing through the instrument will be always a joyful sight to the patient, by affording him the most convincing proof that the instrument has entered his bladder.

The intervals for the introduction of instruments, and the time they should be retained, must be regulated by the degree of irritability of the urethra generally, as well as at the seat of disease, also upon the state of the bladder in each particular case.

Very little attention will be sufficient to instruct the surgeon what length of time it is best to allow an instrument to be retained, as also the proper period for its re-introduction. As a general rule, instruments

should not be kept in the urethra less than from five to twenty minutes, and in old hard strictures, I generally let them remain from half an hour to an hour. The mere passing a bougie, and permitting it to remain but for "one or two seconds," as has lately been advised, will, I believe, often increase the irritation of a stricture, when the retention of the instrument for a few minutes would have considerably diminished its morbid sensibility. It should always be borne in mind when dilating a stricture that the bougie exerts a mechanical as well as vital action.

In accomplishing the dilatation of a stricture, before increasing the size of a bougie or sound, it will be best to pass the one last used, which, if permitted to remain in the urethra for a few minutes, will generally very much facilitate the introduction of a larger sized instrument.

There is a plan of effecting dilatation in difficult cases of stricture, which has been very successfully employed, and strongly recommended by Sir Benjamin Brodie. The instrument which he uses is a silver sound with a wooden handle, rather above than below the middle size. The instrument which he generally uses has only a moderate curvature, and is nine inches in length, from the handle to the point; no part of it being more than one-fifth part of an inch in diameter, and the point only a sixth of an inch. The directions given for its use are the following:—"In using the sound you should pass it carefully as far as the stricture, and then press the point firmly against it, taking care that it is directed in the line of the urethra towards the bladder. The pressure is to be continued for five, ten, or fifteen minutes, or even longer, according to circumstances; and this process is to be re-

peated once in two or three days. If a false passage exist, it is probably on the lower part of the urethra, towards the perineum, and it is especially in this situation that, by careless management, one may be easily made. To avoid this mischief, you must direct the point of the sound towards the upper part of the stricture next the pubes. The pressure should be as much as can be made without the urethra being lacerated, and without inducing any considerable degree of pain. In some instances the stricture has little or no sensibility, in others it is exquisitely tender; and in the latter cases the pressure should be very trifling at first, but it may be gradually increased as the tenderness subsides (as it will do) under its influence. The result of this treatment is, that at each operation the anterior part of the stricture seems to become relaxed to a greater or less extent; and that at last the instrument penetrates entirely through it, and enters the bladder. The period at which this happens, of course, varies in different cases."

I have adopted this method of Sir Benjamin Brodie's with great advantage in cases where there are false passages. When, however, the obstruction has been hard, and of considerable extent, and the advance of the instrument has been slow, after it has well entered the stricture the employment of *potassa fusa* has appeared to me to have much facilitated dilatation. I have used the solid silver sound as recommended by Sir B. Brodie, but have had it graduated to within three inches of its point, so that the progressive advancement of the instrument can be accurately ascertained.

Instruments of peculiar construction, besides those previously mentioned, have been invented for effecting the dilatation of strictures. A steel dilator has been

passed into the obstruction, and then, by means of a screw or other contrivance, the different parts, of which the vesical end of the instrument is composed, have been extended. Mr. Arnott has recommended a dilator of his invention, made of a tube of varnished silk, which is to be passed into the stricture, and then inflated by air driven into it with a syringe. These dilators are, of course, applicable only when an instrument can be passed into the obstruction, in which case, I believe, that bougies and sounds will be found to accomplish dilatation in a more satisfactory manner, as their action can be regulated with much greater precision than the former. Mr. Arnott considers that his instrument has the advantage of dilating the stricture to any extent without irritating the healthy portion of the urethra. I think that no good effect will be produced by stretching the strictured part beyond the healthy calibre of the urethra; and usually the careful introduction of a bougie, at proper intervals, has the effect of diminishing, rather than increasing, the natural irritability of the canal.

Public attention has lately been excited by the announcement of the invention of a set of dilating instruments by Mr. T. Wakley, which, according to that gentleman's statement, are capable of effecting a "prompt removal of strictures of the urinary canal." These instruments consist of a series of graduated silver tubes of eight different sizes, and a similar number of elastic ones, the latter composed of a flexible metal covered with elastic gum fabric. The first process in this method of dilatation is the introduction of a small No. 3 silver catheter into the bladder, as a director to the tubes, which are then to be pushed in succession over the directing catheter through the stricture, their size being increased at the discretion of the surgeon,

whilst the advantage thus gained, we are informed, can be preserved by introducing one of the elastic tubes, which is to be substituted for the silver one, and retained as long as may be thought proper.

Notwithstanding the evidence adduced in support of this mode of treatment, which consists in the narration of several cases of stricture previously very intractable, but which, under the use of Mr. Wakley's instrument, we are informed, were completely dilated in the short space of a few days, or at the most, a few weeks, there are, probably, many surgeons who, like myself, may still be sceptical enough to question the possibility of effecting a permanent cure or removal of such urethral obstructions by rapid dilatation, whatever may be the method of accomplishing that process. That such strictures may sometimes be rapidly stretched by Mr. Wakley's plan, so as to admit, within two or three weeks' time, the introduction of a full-sized instrument, I can readily believe, that is, supposing the patients operated upon to be placed in circumstances favourable to the proceeding as regards rest, and more especially with their urinary canals possessing unusual tolerance when suffering from such intractable forms of stricture. There are, I presume, but few surgeons at all conversant with the treatment of old hard strictures, who would consider the method just described capable of effecting their cure. My own experience, as will be seen, is not favourable to the treatment of urethral obstruction by rapid dilatation, except under peculiar circumstances, and then I should certainly prefer the usual method of effecting that process to the use of Mr. Wakley's instrument, believing that the pushing one tube over another in old hard strictures, must be

especially liable to cause more or less laceration of the diseased tissues.

Another stricture dilator, a modification of M. Pérervé's instrument, has lately been designed, and strongly recommended by Mr. Barnard Holt, a description of which is contained in the "Lancet" of February 7th, 1852. Mr. Holt's instrument permits the urethral tubes to be passed between the blades of the director.

It will be seen that previous to the use of either of these dilators, it is necessary to introduce into the bladder a No. 3 silver catheter, or steel director, so that, in fact, the instruments are available only after the greatest difficulty, in a bad case of stricture, that of getting a small catheter into the bladder, has been surmounted; they are, therefore, useless in the treatment of the worst and most embarrassing forms of stricture, called impassable, from their remaining long impermeable to instruments in the hands of the generality of surgeons. When rapid dilatation is desirable, and the case one in which retention of the catheter may not be advisable, Mr. Holt's instrument will, I think, be found useful. For example, in the complication of urethral obstruction with vesical calculus, should the stricture not be particularly irritable, by the assistance of Mr. Holt's dilator, the surgeon will be able sooner than by the use of the bougie or sound, to effect the removal of the stone.

M. Leroy D'Etiolles has also advocated the forcible and rapid dilatation of strictures by the introduction in succession of several graduated instruments, until full dilatation is accomplished. In some few instances of intractable strictures, when the deeper-seated urethral tissues are not affected, the obstruction consisting


merely of a ridge of thickened mucous membrane, it is possible that a cure may be obtained by forcible dilatation. Mr. Guthrie, indeed, informs us that some of the best cures he has effected in urethral obstructions, has been when he has felt the edge of the stricture caught upon and yield to the point of the dilating instrument. Let me, however, entreat my readers to regard such cases merely as exceptions to the common course of events, instances of unusual good fortune, and not as precedents justifying forcible dilatation, which, generally, is highly injurious.

When rapid dilatation has been effected by the dilators without any untoward occurrence, the symptoms of stricture will, doubtless, be mitigated for some time, by the constricted channel being widened or stretched, for that is principally their mode of action, and not, as many imagine, by causing absorption of the thickened tissue, the actual source of disease. If, in the treatment of stricture by dilatation, it be deemed sound policy to follow out consequences, and to look to permanent results, disregarding such advantages as are merely temporary, as is the case in most worldly matters, then, I am well convinced that gradual dilatation, from the more enduring benefit which it confers, is far preferable to that which is rapidly or forcibly effected.

When a stricture is very much contracted, it is sometimes exceedingly difficult to hit its orifice, and in such cases the introduction of a model-bougie is frequently found useful. In these cases, M. Leroy D'Etiolles strongly recommends the employment of bougies with their ends twisted in different ways, by which means it appears he has often been successful in their introduction after frequent failures with those instruments as commonly shaped. The following passage relating to

this subject will be found in the excellent work of M. Leroy D'Etiolles on Strictures :—

“*La bougie tortillée.*—Pour introduire la bougie tortillée il n'est pas nécessaire de lui imprimer un mouvement de rotation, il faut la présenter tres-doucement au rétrécissement ; si elle bute, on la retire d'un centimètre environ, on lui fait exécuter un quart de cercle, et de nouveau on la fait cheminer ; le passage lui est, il refusé encore, on la retire une seconde fois, elle recoit un léger mouvement de rotation d'un autre quart de cercle, puis elle pousée en avant ; sa pointe est présentée successivement ainsi dans toutes les sinuosités de l'angustie.”

Sir B. Brodie observes that in cases of retention of urine, when “the straight catgut bougie cannot be passed, we shall often succeed in effecting its introduction by bending the point of it, thus,  which contrivance enables us to keep the point sliding against the upper surface of the urethra, avoiding the lower part in which the obstruction is always most perceptible, and in which the bougie is most likely to become, as it were, entangled.”

Whatever may be the mode of treatment employed, the object of the surgeon must be to restore the strictured portion of the urethra to its normal size, he should, therefore, never be satisfied, until complete dilatation, whenever practicable, has been effected.

The degree to which dilatation should be carried, must be regulated by the size of the urethral orifice, which, in the healthy state of the canal, being usually its smallest part, whatever instrument it will admit without uneasy distension will consequently pass forward with facility into the bladder.

DILATATION BY RETENTION OF THE CATHETER OR
BOUGIE.

This method of cure was much practised, as well as strongly recommended, by the late Baron Dupuytren, and was considered by him to be of two kinds: the first, or "vital dilatation," he had recourse to in every case in which no instrument could be made by a moderate and safe degree of force to enter the stricture, except in an emergency where, from continued retention of urine, a few hours' delay might prove fatal. The instrument preferred by the Baron for this dilatation, was a gum elastic bougie of medium size, of sufficient length to reach the obstruction, and to project about an inch from the orifice of the urethra. The bougie having been introduced, was fixed in the urethra by the usual means, so as to keep up a gentle pressure against the face of the stricture, the dilatation being facilitated, it was supposed, by turning the instrument from time to time in the canal. Dupuytren states, in his "*Lécons Orales*," that, often in a few hours, and, in less fortunate cases, in a few days, by this method, the obstruction of the urethra will be overcome without difficulty, laceration, or discharge of blood. The action of the bougie used in this manner was considered by the Baron to be of two kinds, its first effect being the removal of spasm; for, however firmly the instrument may be grasped on its introduction, in a short time it will admit of being freely moved in the urethra. Secondly, after retention of the bougie for a few hours in the urethra, a more or less abundant discharge of mucus, or muco-purulent matter occurs. Under the influence of these two phenomena, the removal of

spasm and free urethral discharge, the stricture becomes dilated, in some cases quickly, in others more slowly. The dilating power of a bougie when retained against the face of a stricture, was accidentally discovered by Dupuytren in the case of a gentleman of extremely nervous temperament, who was suffering from retention of urine, caused by an impassable obstruction. This gentleman was so alarmed at the idea of the introduction of an instrument into the urethra, that it required much persuasion to induce him to submit to the operation. Dupuytren having at length succeeded in introducing a small bougie as far as the stricture, but without being able to get the point of the instrument into the obstruction, and wishing to make a further trial in the course of a few hours, determined to fix it in its position, fearing that if withdrawn, the patient might not submit to its re-introduction.

On his return in a few hours' time, he found that the gentleman had passed some urine by the side of the bougie, which could now be readily engaged in the stricture. The bougie gradually advanced, and at the end of twenty-four hours was passed into the bladder. Complete dilatation of the obstruction was effected by the retention of catheters, their size having been gradually increased. The value of the discovery was fully appreciated by this sagacious surgeon, and the method of relief thus accidentally made known, was afterwards successfully adopted by him in most cases of impassable stricture.

In cases where the point of the bougie could be made to enter a stricture, so as to be engaged in its grasp, Dupuytren fixed and retained it in that position, the bougie usually employed being a gum elastic one, gradually tapering towards its point. The instrument

thus fixed within the obstruction, sooner or later caused its dilatation. A sufficient length of the bougie was left projecting, to admit of its being gradually advanced by the hand of the patient or surgeon, as the dilatation proceeded. The bougie was retained in the urethra until it could be made to enter the bladder, when it was changed for a gum elastic catheter, complete dilatation being effected by the latter. This was called by Dupuytren, "mechanical dilatation," and he compared the operation of the bougie to that of a wedge. The urethra, however, being a living part, the action of the bougie, although perhaps, principally mechanical, must have been also partly vital.

Dupuytren availed himself of his discovery of vital dilatation in the treatment of impassable strictures, and from this time ceased to employ force to overcome them by the method previously adopted by Dessault at the Hôtel Dieu.

Dupuytren strongly condemns the employment of force, and states that in ten individuals in whom that practice was adopted, half of them experienced lacerations of the urethra, swellings of the penis, and infiltrations of urine, the result having been occasionally fatal. His concluding observations on dilatations of the urethra cannot be too forcibly impressed on the mind of every surgeon who follows the practice recommended. The gist of these observations is, that whenever an instrument of the smallest calibre can be passed through a stricture, it will be possible in ten or twelve days to dilate the canal to its full size, yet such rapid dilatation is never desirable, as it is often followed by very severe consequences. He observes, that the tissues forming strictures possess an extensibility, the bounds of which can scarcely be passed without causing laceration, and

even destructive inflammation. The dilatation should, therefore, be very slowly effected.

In the greater number of Dupuytren's cases, the dilatation was only temporary, the strictures having had a tendency to return. He consequently strongly enforces the necessity of the use of bougies for some length of time afterwards, gradually extending the interval of their introduction. The practice of vital dilatation, by fixing a round-pointed hollow elastic gum bougie of medium size against an impassable stricture, has also been strongly recommended by Mr. Guthrie, and was successfully adopted by him in several instances before he knew that Dupuytren had long been pursuing a similar plan of treatment. Mr. Guthrie observes, that "the continued presence of a bougie against a stricture, instead of increasing irritation, has the directly contrary effect; and that, after it has been retained a few hours, if a patient becomes sensible of any difference, it is that his water passes more freely than before." Mr. Guthrie inculcates the necessity of effecting the dilatation slowly, observing, that "the greatest evil arises from increasing the size of the bougie too rapidly." He also enforces the necessity of continuing for a long time the introduction of the bougie.

Dilatation of strictures by retention of the catheter is much practised by French surgeons, but has never been a favourite method of proceeding with English practitioners. The truth is, that in France this mode of treatment does not appear to cause so much irritation as in our own country. There must surely be some reason for this. We cannot, indeed, suppose the urethra of a Frenchman to be different to that of an Englishman, yet the former, it would appear, has commonly less irritability than the latter, especially as re-

gards its tolerance in the retention of instruments. This circumstance may probably be accounted for in some degree by difference of climate and diet, rendering the Englishman more predisposed to inflammation than the Frenchman. Moreover, should inflammation occur in the latter, it is usually of a milder character, and easier controlled than when it attacks the former. We have, indeed, a familiar illustration of this difference in the almost invariably successful treatment of acute pneumonia with emetic tartar in France, whereas in England the same disease, treated by the same remedy, commonly requires, in addition, the abstraction of more or less blood. The pain and irritation, often of a severe character, which so commonly occur in this country during the dilatation of strictures by retention of the catheter, are, indeed, sufficient reasons in themselves for the practice being adopted only under peculiar circumstances, and not as a matter of choice. Another good and sufficient reason, however, for the non-selection of this method is, that the more quickly the dilatation of a stricture is effected, the greater is its liability to return, a well-known fact illustrative of the old proverb, "The greater haste, the less speed." To these reasons may be added, the necessary confinement of the patient to his room during the process of dilatation, which, although last mentioned, is not, perhaps, the least influential of the causes assigned for the preference of English surgeons to the treatment by the bougie. There are, however, special occasions in which retention of the catheter proves a most valuable auxiliary in the treatment of stricture. The first case in which we may be desirous to avail ourselves of this mode of treatment, will very probably be one of retention of urine, the result of long-continued stricture, in

which the patient's sufferings from a distended bladder will, perhaps, be most acute. It may happen, that by persevering and gentle attempts we shall at length be successful in getting a No. 2 catheter into the bladder, thus, perhaps, relieving the patient from a state of almost indescribable agony. In this instance, there can be no doubt of the propriety of retaining the catheter in the bladder, whether it be one of silver or of elastic gum; but if the latter, so much the better, as it is less likely to cause irritation than the former. The instrument should be plugged up, and the patient can remove the plug whenever he desire to pass his water. Most probably, in the course of two or three days, sooner or later, the instrument will be so loose in the urethra, that it may be easily replaced by one of larger size, and perhaps the complete dilatation of the stricture may be effected by continued retention of the catheter, should no great irritation ensue from its presence. In my own practice, however, if there are no false passages or disposition to rigors, as soon as the obstruction will admit of a No. 7 or 8, I prefer gradually accomplishing the remaining dilatation with the bougie, and perhaps an occasional application of the potassa fusa. The reason for retention of the catheter, in this instance, is obvious, for should the instrument have been withdrawn soon after evacuation of the bladder, it is possible that the next attempt to introduce it, which would probably soon have been required, might not have been attended with the same success.

In old hard strictures, especially when long and irregular, the occasional retention of a catheter for a day or two, will sometimes somewhat facilitate their subsequent dilatation.

Another instance in which the treatment, by reten-

tion of the catheter, will be of great value, and should, if possible, be adopted, is where there is one or more false passages. It often happens, that in such a case no slight difficulty is experienced in getting an instrument through the natural channel into the bladder. Here, if once successful in our object, but little farther skill will be required, if the catheter be retained, and, when loose, replaced by one of larger size, taking care slowly and cautiously to complete the dilatation by the same means. The treatment by retention of the catheter has been strongly recommended by Sir. B. Brodie, in cases of highly irritable strictures, in which rigors, commonly succeeded by considerable constitutional disturbance, are of frequent occurrence after the introduction of instruments, and in which often but little progress can be made with the bougie. Sir B. Brodie was led to the adoption and recommendation of this plan on discovering the cause of these rigors to be the passage of the urine over the strictured portion of the mucous membrane having been rendered more irritable by the bougie. In many similar cases, however, I have succeeded in removing the irritability of the strictures by a few applications of the potassa fusa, after which the obstruction has yielded to the common bougie. In some persons, the continued presence of a catheter in the urethra causes so much irritation and subsequent inflammation, that this treatment cannot be judiciously pursued. In such cases, where rigors are apt to occur, from the passage of the urine after the use of the bougie, their occurrence may often be prevented by relieving the bladder, when required, by the introduction of a small gum elastic catheter without its stilet, the patient having been, of course, desired not to pass his water. As the stricture becomes dilated, the introduc-

tion of the catheter will, probably, not long be required.

It is proper, however, here to observe, that by keeping patients under the influence of opium a little before and after the introduction of instruments, the occurrence of rigors will often be prevented. In cases of extravasation of urine, whether from ulceration or accidental rupture of the urethra, a catheter should, if practicable, be passed into the bladder and retained. In strictures highly predisposed to spasm in which a bougie may be strongly grasped for some length of time, the retention of a catheter for a few hours will often be of great service. In some persons, however, retention of a catheter in the bladder causes so much irritation of that organ as to render its presence almost insupportable; and a patient, under such circumstances, will often withdraw the instrument himself, regardless of the result. In such cases our object can often be obtained by withdrawing the catheter a little way out of the bladder; an inch will probably be sufficient. It must be fixed in that position, and whenever the patient requires to pass his water, the instrument should be gently pressed forward for that purpose.

There can be no doubt that vital dilatation may be sometimes advantageously practised in stricture patients whose time is at their own disposal; but in cases where this plan appeared to me to be applicable I have usually preferred the treatment by *potassa fusa*. If, however, the potash had proved unsuccessful, and no urgent symptoms been present, requiring more immediate removal of the obstruction, I should certainly have made trial of vital dilatation before resorting to division of the stricture. Mr. Guthrie, who has had much experience of this method of treatment, informs us, in his

work on "The Anatomy and Diseases of the Urinary and Sexual Organs," that he has been successful with it in overcoming the obstruction when not of any great extent. He has related some interesting cases in illustration of this treatment.

The treatment of stricture by vital or mechanical dilatation will require much attention on the part of the surgeon, and self-denial on that of the patient. If the latter be prudent, live rather low, and abstain entirely from fermented liquors, the surgeon may perhaps slowly effect complete dilatation of the obstruction with but very little medical treatment beyond the exhibition of an opiate every night at bed-time, followed by a dose of castor-oil in the morning. These precautions, with probably the occasional application of a few leeches to the perineum, will, in most cases, be successful in keeping within safe bounds the irritation resulting from continued retention of instruments in the urethra. In some cases, however, so much inflammation of the mucous membrane of the urethra and its adjacent textures will ensue, the mischief probably extending to the bladder, that this treatment must be given up, at all events, for some little time, if not entirely abandoned. Whenever this practice is pursued, it will be a great relief to the patient if the catheter or bougie be occasionally withdrawn, and the urethra left quiet for a day or two, or even for a few hours. This can, I think, generally be done without interfering with the ultimate success of the treatment.

The error, I believe, most likely to be committed in this mode of treating strictures, is, that of increasing the size of the catheter or bougie too quickly, an error which should be especially guarded against, as nothing is perhaps more apt to cause mischief than over-distension.

sion of tissues, which are in these cases more or less irritable and inflamed. Besides the fact, previously stated should always be remembered, viz., that strictures quickly dilated are more likely to return than when their dilatation has been slowly accomplished.

In concluding these few remarks upon dilatation, I must acknowledge that it appears to me almost impossible to prescribe such general rules as are applicable to the infinite varieties of strictures, diversified by individual peculiarities of constitution, and, consequently, requiring some modifications in their management. No man can possibly predict, precisely, what any urethra will bear until he has fairly tried its temper.

CHAPTER VII.

TREATMENT OF STRICTURES OF THE URETHRA BY CAUSTIC.

WITH few exceptions, practitioners of the present day, in their treatment of stricture, depend almost entirely upon dilatation, from the supposition of its being, under all circumstances, the best method of proceeding. To be successful, however, in the treatment of any disease, it will surely be admitted that the means employed must be adequate to the attainment of the end in view. Although dilatation may succeed in the generality of strictures, yet it will not do so in all, for cases of urethral obstruction not unfrequently occur in which we must either adopt some more efficient treatment or leave the unfortunate sufferers to drag on a miserable existence, which may, at any time, be cut short by destructive ulceration of the urethra, and subsequent extravasation of urine.

For the relief of such cases, caustic has been successfully employed by many surgeons of high character. I shall endeavour to place fairly before the Profession the result of my experience of this method of treatment. It is not from any hastily formed views upon this subject, from the attainment of success in a few instances,

but from more than twenty years' observation of the effects of caustic potash in bad cases of stricture, that my conclusions have been drawn. The objections to the employment of caustic in the treatment of strictures of the urethra, which are so commonly entertained in the present day may, with equal propriety, be applied to almost every powerful remedy used for the relief of human suffering. All the arguments brought forward in books, or otherwise, for the entire abandonment of such efficient agents as the nitrate of silver and caustic potash in the removal of obstructions of the urethra, are, to my mind, of very slight import, as, when strictly examined, they will be found to apply solely to the abuse of those remedies.

Various escharotics had been used for the destruction of strictures long before the time of Hunter. In the following remarks from Mr. Hunter's "Treatise on the Venereal Disease," will be seen the result of his experience of the application of nitrate of silver to strictures: "If the obstructions are anywhere between the membranous part of the urethra and glans, where the canal is nearly straight, or can easily be made so, it becomes an easy matter to destroy them by caustic; but if beyond that, it becomes then more difficult; however, at the beginning of the bend of the urethra the obstruction may be so far removed as to admit of the passing of a bougie, or at least to procure a tolerably free passage for the urine. I have seen several cases where it was thought necessary to follow this practice, and it succeeded so well, that, after a few applications of the caustic, the bougie could be passed, which is all that is wanted. I look upon the caustic as a much safer method than using pressure with a bougie, on account of the danger of making a new passage without

destroying, in the least, any part of the obstruction." In another passage, Mr. Hunter observes : " I have often tried this practice in strictures where there were also fistulæ in the urethra, and where the water came through different passages. Such cases are not the most favourable, yet I succeeded in the greater part of them ; that is, I overcame the stricture, and could pass a bougie freely. I have seen several cases of fistula of these parts, where the natural passage was obliterated by the stricture, in which I have succeeded with the caustic, and the fistulous orifices have nearly healed."

Sir Everard Home, in his well known work on Stricture, has strongly advocated the employment of lunar-caustic. He not only used it in aggravated forms of that disease, but indiscriminately in all urethral obstructions, with a boldness, and to an extent that frequently caused great suffering, such as rigors, retention of urine, and sometimes profuse hæmorrhage. Sir Everard Home's work on Stricture has, however, always appeared to me to be of great value ; for, whilst the capabilities of the caustic in removing many bad forms of that disease are proved by a sufficient number of facts to convince all but the ultra-sceptical, its injurious effects are also stated with a candour well worthy of imitation.

That the treatment by caustic was frequently adopted by Sir Everard, in cases where the employment of milder measures would have been more judicious, and that it was pushed by him to an injurious extent, cannot be denied. That his recommendation of the employment of the nitrate of silver in all cases of permanent stricture, led, in many instances, to a fearful abuse of that remedy in the hands of others, must also be admitted. Mankind generally are apt to entertain ex-

treme views, and because rigors, false passages, and sometimes, debilitating hæmorrhages were found to result from the caustic treatment, or rather its abuse, a really valuable means of cure in many intractable cases of stricture was soon abandoned by the generality of surgeons.

After the ample evidence of the powers of the nitrate of silver in removing many strictures that had previously been impermeable to the bougie, recorded by Hunter, whose truthfulness and accuracy of observation are unquestionable, besides the greater number of similar cases mentioned by Sir Everard, one would imagine that the *capability* of caustic to destroy many obstinate forms of urethral obstruction could scarcely be questioned by any rational being. As if, however, to prove how far professional scepticism can be carried, in a pamphlet on Stricture, published by Professor Syme, are the following observations: "I do not hesitate to express my persuasion that a real organic stricture cannot be removed by caustic, since, even admitting that the agent could be accurately applied, the destructive effect of the nitrate of silver is so limited as to be quite inadequate to the purpose, while that of potass is so diffused, that, in the event of destroying the stricture, it must cause a worse one through the unavoidable loss of substance attending its operation, and the consequent contraction in healing. On the whole, it seems more probable 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." (Page 52.)

It appears probable, however, that since this passage was written, Mr. Syme has found out that there were surgeons who seemed more inclined to place confidence

in the ample experience of Hunter, Home, and others than in his own recorded "persuasion," that a stricture cannot be removed by caustic ; for of Mr. Syme's personal experience of the caustic treatment, as he has given us no proofs, we may naturally conclude that he has none to offer ; which conclusion, it appears to me, is much strengthened by some observations in the "Monthly Journal of Medical Science," for July, 1850 ; in which, I regret to say, the laws of common courtesy and liberality that should characterize all scientific discussions, are so completely forgotten, that it might be imagined some enemy of Mr. Syme's had written them and appended a name so distinguished in the annals of surgery. In those observations even the dead are summoned from their graves to aid the author in his extremity ; for we are there favoured with the perusal of some letters addressed to the grandfather of the present Mr. B. Bell. It might reasonably be supposed that these letters, eight in number, thus disturbed from their time-honoured slumbers, contained ample evidence of the inutility of caustic in stricture, from men who had fully and impartially tested its curative powers in that disease ; it turns out, however, that these letters were written by Sir E. Home's contemporaries and rivals in practice, who were opposed to his treatment, and, consequently, urged every possible objection against it. These antique documents have lately been hunted up by the present Mr. Bell, from some quiet depository where they had innocently reposed for nearly half a century, and presented to his friend, Mr. Syme. It appears that the late Mr. B. Bell himself was not only strongly opposed to Sir E. Home's treatment, but that he also took some trouble to procure the opinions of surgeons who were favourable to his own views. What

remedy, let me ask, will have a fair chance of success in the hands of him who is strongly prejudiced against it? It surely would have been but even-handed justice in Mr. Syme, if he had, at the same time, also published a letter of Sir E. Home's to the late Mr. B. Bell, which appears in Sir Everard's second volume on Strictures. A gentleman, suffering from bad strictures, had been for some length of time under the care of Mr. Bell, who, amongst other remedial measures, had also used the nitrate of silver, but without success. This gentleman, finding he got no better, applied to Sir E. Home. Sir Everard's letter is in reply to one from Mr. Bell, which contained an account of the treatment that had been adopted whilst the patient was under the care of the latter, and is as follows :—

“ Sackville Street, Sept. 19th, 1799.

“ DEAR SIR,

“ The condemnation of my mode of treating strictures flattered me exceedingly, as it is evidence on record of my having acquired a more extensive knowledge of the disease than had been attained by the surgeons in Edinburgh. After such a decision success was hardly to be expected from the use of caustic in your hands; it will, however, gratify a man of your humanity to learn that five applications of the armed bougie, without the aid of medicines, have enabled the patient to pass a full-sized bougie into his own bladder; and, as all his other complaints have left him, you will agree in believing that they must have been sympathetic of the stricture in the urethra.

“ I am, &c.,

“ E. HOME.”

I know that many excellent English surgeons are in the habit of occasionally employing the nitrate of silver in bad cases of stricture, and often with successful results. Among others, it will be sufficient to mention the names of Bransby Cooper, Guthrie, Mackilwain, and Phillips. Several cases treated with caustic will be found recorded in Mr. Bransby Cooper's cases of stricture in "Guy's Hospital Reports." Mr. Guthrie's observations upon this method of treatment are so much to the point as to induce me to insert them here. Mr. Guthrie, after having alluded to the prejudices which have long existed against the use of caustic in strictures, observes, "That like most other prejudices, they have some foundation in truth ; but it is the abuse of the *argentum nitratum*, and not the use of it, which has given rise to them. I honestly confess I dare not say to a stranger, whatever his case may be, and however successful a few applications of the caustic might be, that I mean to use it. I dare not do so until after a few visits, and we have more confidence in each other ; perhaps, only after he sees that he does not make much progress. I should lose my patient if I did, who would go to another, and might be told, that he had narrowly escaped the worst treatment in the world, an opinion he would not fail to repeat. Nevertheless, the *argentum nitratum* is a valuable remedy, when properly used, in appropriate cases, and not abused. At some future time, when the prejudice which has arisen against its use shall have passed away, it will again take its place, with other means, as a very effective remedy in certain forms of stricture." In the latter part of Sir Everard Home's work, the following passages occur : "I have had numerous opportunities of knowing that no return of

the symptoms has taken place in fifteen or twenty years, although no bougie had been used since the cure had been completed ; and when the urethra was examined after death, the part in which the stricture had been, had the same smooth surface as the rest of the canal. *In cases of failures, from the strictured part having become so hard and thick as not to be destroyed by the nitrate of silver, it is to be regretted that we have not a more powerful caustic, capable of being applied to the urethra, since that is all that is required for their removal."*

Surely sufficient evidence has now been given to prove that the nitrate of silver may be used with advantage in some forms of stricture. Although, in my own practice, I very rarely use that caustic in the treatment of stricture, yet many instances have come under my notice where it has been used with advantage by others. It is, at present, the fashion to decry this remedy, apparently for no other reason than its having often been applied to an injurious extent, and that it will not cure all cases of stricture. But what are the means devised by human skill, and dependent upon human judgment for their administration, that will not sometimes be abused, and fail in affording the desired relief? The most eminent surgeons have, in fact, been of late so prejudiced against the use of caustic in stricture of the urethra, that when consulted in aggravated cases where it has been used, they have unhesitatingly ascribed every untoward circumstance which may have occurred during the treatment, to the effects of that remedy. I can truly say, however, that while I have witnessed some most severe effects from the too forcible introduction of instruments, no bad results, have, in my own practice, followed the application of caustic. In so

harassing a disease as stricture often proves, I think we are not justified in rejecting any remedy that has been found useful.

The only caustic besides the nitrate of silver, at present used in the treatment of urethral stricture, is potassa fusa, which Mr. Whately has the merit of having been the first to employ in that disease. From some cause or other, notwithstanding the strong recommendation of Mr. Whately, this truly valuable caustic has been but little used in the treatment of stricture. Before giving the result of my own observations upon the curative powers of potassa fusa in stricture, I shall introduce some quotations from the work of Mr. Whately, entitled, "An Improved Method of Treating Strictures in the Urethra." In that work are the following remarks:—"In every stricture, before we apply the potassa fusa, we ought to be able to pass a bougie into the bladder of at least a size larger than the finest kind. This is necessary to enable us to apply the caustic to the whole surface of the stricture, and likewise to put it into our power to remove a suppression of urine, should it occur during the use of the caustic. A small hole, about the sixteenth part of an inch deep, should be made at the extremity of the bougie, which should be just large enough to enter the stricture. A piece of broken caustic, half the size of the smallest pin's head, should be selected; the particle cannot indeed be too small for the first application. Let this be inserted into the hole of the bougie, and pushed down into it so as to sink the caustic a very little below the margin of the hole. To prevent the kali from coming out, the hole should be contracted a little with the finger, and the remaining vacancy in it filled up with hog's lard.

"When the bougie has reached the anterior part of

the stricture, it should rest there for a few seconds, that the caustic may begin to dissolve. It should then be pushed very gently about one-eighth of an inch, after which there should be another pause for a second or two. The bougie should then be carried forwards in the same gentle manner till it has got through the stricture. When the caustic bougie has passed through a stricture, it should be withdrawn to the part at which it was first made to rest, after which it should be passed very slowly through the stricture a second time. If the patient complain of pain, the bougie should be immediately withdrawn; but if not, we may repeat the operation by passing and withdrawing the bougie through the stricture once or twice more. It is essential that the bougie pass through the stricture at each application of the caustic. We ought, therefore, to pass the bougie we intend to use once through the stricture before the kali is inserted into it. At the end of seven days the application may be repeated; and if the patient felt no degree of pain, a piece of kali, a small degree larger than the first, may be selected. The operation should be repeated till the contracted part of the urethra is dilated, if possible, to the natural size. We are, however, on no account, to increase the quantity of caustic as we increase the size of the bougie. I do not in any case apply more of the kali purum at a time than a piece about the size of a common pin's head. Twelve bits of the largest size weigh one grain. There are some cases in which the contraction is so irregular, and its aperture so untowardly situate, that a bougie cannot readily, if at all, be passed into it; others have likewise been described, in which it is impossible to pass a bougie through the stricture. If, in the former of these cases, a bougie with the kali cannot be passed

into the stricture, or if it get through the stricture, and do not destroy the irregularity, and it becomes necessary to apply a caustic to the anterior part of the contraction, I should certainly prefer the lunar-caustic to the kali purum."

Mr. Whately observes, "It would be difficult to weigh such small pieces of caustic. In order, therefore, to convey a clear idea of the different quantities to be used, I shall here represent them by three dots of different sizes, thus"

From the result of no inconsiderable experience of the use of potassa fusa in many intractable forms of urethral obstruction which had resisted the ordinary means of treatment, nitrate of silver included, I am convinced that the excellent effects of the former caustic are but little known to the generality of surgeons. It was the inefficient, unsatisfactory action of nitrate of silver in old hard strictures, particularly such as were impermeable and of considerable extent, that first induced me to give the caustic potash a trial. I very soon became convinced of its superiority to nitrate of silver in such cases, having found that more good might be effected in the majority of gristly strictures by one application of potassa fusa than by several of nitrate of silver. I found also that, to be effective in these cases, it was necessary to employ the caustic more freely than was recommended by Mr. Whately, and that this might be done with perfect safety.

This caustic, when properly applied to strictures of the urethra, causes a sensation of heat, not commonly of a painful description, except in such as are irritable, and then the pain is of short duration. The property possessed by potassa fusa of combining with oily substances and animal mucus, forming a saponaceous com-

pound, modifies its action, and enables it to penetrate the hardened tissue of a stricture, to soften, and promote its absorption more effectually than the nitrate of silver.

To observe the action of potassa fusa I have occasionally applied it in the same manner as in stricture to hard spots on the tongue, caused by slight thickening of its mucous and submucous tissues. The part in immediate contact with the potash quickly changes to a deep brown, surrounded by a small red circle, and a little bloody serum oozes out. For two or three days afterwards the surface has a whitish appearance, and, at the end of a week or less, usually looks quite healthy.

Potassa fusa appears to me to act beneficially upon strictures, by relieving irritability and inflammation; by promoting absorption and stimulating the congested vessels to contraction; by its dissolvent powers.

The caustic potash may be advantageously applied to strictures for two purposes:—one to allay irritation, the other to destroy the thickened tissue which forms the obstruction. When used in the minute quantity employed by Mr. Whately, I believe its action to be simply that of allaying irritation, as, when mixed with lard and oil, combined with the mucus of the urethra, it can scarcely have any effect beyond a mild solution of caustic, which most probably causes a more healthy state of the lining membrane of the stricture. Before using the potash, a bougie should be passed down to the stricture, that its distance from the orifice of the urethra may be correctly ascertained. A small piece of the caustic, about the size of a common pin's head to commence with, should be inserted into a hole made in the point of a soft bougie. The caustic should be broken just before it is required, and

the inner or dark part selected, as the outer portion is usually less efficient, being commonly converted into a whitish crust of carbonate of potash. Two notches should be made in the armed bougie, as directed by Mr. Whately; one, marking the exact distance of the stricture; the other, an inch beyond; so that its progress, as it enters the obstruction, may be accurately observed. The bougie should be moulded with the finger round the potassa fusa, so that it may be securely fixed; but, to insure the action of the caustic, instead of being below the level of the hole in the instrument, as recommended by Mr. Whately, its points should be fairly exposed to enable it to act upon the stricture.

I have been particular in these directions from a conviction of their necessity; for if Mr. Whately's injunctions regarding the method of using the potassa fusa be literally followed, and his exceedingly minute quantities of caustic be inserted below the level of the pole in the bougie with a covering of lard, I well know there can be no efficient action of the remedy upon the stricture, a fact of which any one may soon convince himself. It is evident that Mr. Whately, from his over-anxiety to prevent the abuse of this valuable caustic, has given such precautions for its employment, that if strictly obeyed, must render the remedy of little value.

The armed bougie should, of course, be well oiled before its introduction, and if the points of the caustic are well covered with lard, there need be no fear of its acting before it reaches the stricture. The bougie should be gently pressed against the stricture for a minute or two if impermeable, and then withdrawn. When the caustic is applied to permeable obstructions, the bougie should be passed three or four times over the whole surface of the stricture. To impermeable strictures the

caustic should be applied with greater caution than to such as are permeable, for should retention of urine occur, it will be more easily relieved in the latter than in the former. It usually happens that after one or two applications of the caustic, the bougie will be found to enter the obstruction.

Before applying potassa fusa to impermeable strictures, every precaution should be taken to guard against irritation. If convenient, the application may be made at bed-time, taking care that the patient passes his urine just before; and, should he have been subject to rigors or retention, it will be best to administer an opiate injection an hour previous to the operation. Many surgeons appear to have been afraid of using potassa fusa in stricture, from its so readily liquefying when exposed to the air, having on that ground principally preferred the argentum nitratum. Such fears are, however, groundless; for, contrary to what is generally supposed, potassa fusa, from its forming with oil and mucus a slimy saponaceous compound, admits of being more easily confined to the strictured portion of the urethra than the more watery solution caused by the nitrate of silver. This is one advantage in favour of the caustic alkali. Another, arising from this miscibility with oily substances is, that its action can be better regulated than that of the nitrate. It may be used either as a mild stimulant or as a powerful caustic.

It appears to me, however, that the principal superiority of this caustic to the nitrate of silver consists in its more powerful solvent effect in removing hard strictures, and that with perfect safety and comparatively with but little pain. It has been previously stated that when used for the destruction of hard gristly strictures, it must be more freely applied than recommended by

Mr. Whately; but the quantity should be very gradually increased, and regulated according to its effects. Some of the accidents caused by the nitrate of silver when used for the destruction of strictures, have arisen either from the slough which it produced having so completely obstructed the previously contracted channel as to cause retention of urine, or, on its separation, hæmorrhage to a considerable amount. From the tendency of the nitrate of silver to produce adhesive inflammation, it is probable that the coagulable lymph, caused by its free application, may form no slight barrier to its destructive effects. This tendency, I think, may, in some degree, account for the great number of applications of this caustic which were required in some of Sir Everard's cases.

Potassa fusa when used for the destruction of a stricture, instead of causing a solid slough, appears to exert its salutary effects by a process of inflammatory softening and dissolution of the thickened tissue forming the obstruction. A sufficiently free application of this caustic to be effective in old hard strictures, is usually followed by more or less of a slimy muco-purulent discharge, at first generally tinged with blood, but soon becoming of a dirty white colour. The term abrasion, used by Mr. Whately, is not certainly the most appropriate to signify the effects of the caustic potash in the removal of strictures, for its action cannot be regarded as mechanical. The term appears to have been used by him to express a slight solvent effect, in reality an ulcerative dissolution of the surface of the stricture. Probably the best explanation of the action of these two caustics, when applied for the destruction of strictures, is that the nitrate of silver causes a slough often sufficiently solid to obstruct the passage of the urine, whilst

the more solvent effect of the potassa fusa is quickly followed by a thick slimy discharge of the tissues which it has destroyed.

There is a passage in the last edition of Professor Miller's "Surgery," with regard to ulceration, which so completely coincides with my own views upon this point, and is so applicable to my present subject, that I shall take the liberty of quoting it in this place: "There is every reason to believe that ulceration may be regarded as a molecular death; a gradual softening and disintegration of tissue, molecule by molecule, the effete matter being mixed with purulent or other secretions of the part, and thus carried out of the system. This process is generally one of true inflammation, or, at all events, connected with some grade of inflammatory action. The steps are—first, true inflammation, with suppuration and softening of the inflamed part; second, disintegration, or death and detachment in minute portions or molecules; third, mixture with the pus and removal by one common discharge. With this process absorption can have little or nothing to do. All new formations are prone to ulceration, being of low organization and of weak vital powers. Absorption is proved to be feeble during ulceration. In sloughing the part no longer dies in molecules, but in mass, and a sloughing sore is said to exist."

The good effects of potassa fusa are often strikingly manifested in highly irritable very vascular strictures, which readily bleed upon slight pressure by the bougie. In many such cases three or four mild applications of the caustic will often be found to remove both their irritability and hæmorrhagic disposition, so as to render them dilatable. In strictures strongly predisposed to spasm, if not firm and of long duration, it will be best

to apply the potash, at first in such small quantities that its action will be merely that of a powerful stimulant, which may probably remove their morbid irritability sufficiently to permit of their subsequent dilatation. I believe, however, that in the majority of such cases, where the disposition to spasm is strongly marked, that the caustic must be used in sufficient quantity to destroy the irritable surface of the obstruction. When a stricture has been so far removed by the application of potassa fusa as to admit the introduction of a middle-sized bougie, it will be best to discontinue the use of the caustic, unless there should be difficulty in its subsequent dilatation, when an occasional application of the remedy will often be found serviceable.

If potassa fusa be used with proper caution it will not cause bleeding of any consequence. Where patients are predisposed to rigors, they may occasionally occur after the application of the potash; but the unarmed bougie, it must be recollected, in such constitutions, will often have the same effect. In truth, the application of the caustic alkali has generally a remarkable effect in preventing the occurrence of rigors.

Two or three applications have frequently so much relieved the irritability of the bladder attending bad cases of stricture, that patients have very often called my attention to this improvement in their condition, which has taken place some little time before the bougie has passed through the obstruction. Instead of being obliged to rise every hour or two in the night to pass their urine, as was the case previously to the application of the caustic, they have been disturbed only once or twice for that purpose.

In two cases of impermeable strictures lately under my care, in which rigors had frequently occurred from

the introduction of the bougie, they happened but once during my treatment, and that was, in each patient, a few hours after, by the use of potassa fusa, I, for the first time, succeeded in passing an instrument through the obstruction. The administration of an opiate will, however, in general, prevent the occurrence of rigors.

The cases in which I have found the potassa fusa advantageous may be generally described as — first, stricture having a cartilaginous hardness and impervious to instruments; secondly, strictures of long standing, which, although admitting the passage of a small bougie, bled more or lessly freely on its introduction; thirdly, irritable strictures and such as have a marked disposition to spasm.

The periods at which it will be most advisable to repeat the application of the potassa fusa must depend upon its effects, and the nature of the cases in which it is used. In many old chronic strictures, I have used the potash advantageously every second or third day, and in some few instances, under peculiar circumstances, even oftener. It will be seen that my views, with regard to this method of treatment, differ materially from those of Mr. Whately. I do not use the potassa fusa in all cases indiscriminately, but only in such as do not yield satisfactorily to simple dilatation. I have found it generally necessary to employ the caustic alkali in larger quantities than he recommended; the minute portions used by him having produced scarcely any perceptible effect upon strictures, which, however, yielded to its more free application. I have also found that the caustic may be advantageously used at shorter intervals than advised by that gentleman, which is frequently of no slight importance, especially to patients who have to come to London for treatment. I gene-

rally, as before mentioned, discontinue the use of caustic as soon as a stricture will readily yield to ordinary dilatation. As a general rule, it will be best to commence the use of potassa fusa in very small quantities, of the size of a common pin's head, especially in impermeable strictures.

Very great care will be required in applying caustic of any kind where there are false passages; and in such cases, if the obstruction be beyond the straight part of the urethra, I use a curved canula for that purpose. Wherever false passages are known to exist, and where instruments have been regularly passed, before commencing the use of potassa fusa, the patient should be kept as quiet as possible for four or five weeks, by which time the false channels may have healed, or become so much closed as to be avoided with tolerable caution. Obstructions in the curved portion of the urethra, although requiring much care in the application of caustic, will usually be found more readily to yield to that remedy, or indeed to any other method of treatment, than when situated in the straight part of the canal.

Except obstructions caused by severe injury of the urethra, when it has been forcibly pressed against the pubes, there are none, according to my experience, more difficult of management, whatever means may be employed, than hard, tight strictures of long standing, within the first four or five inches from the external orifice of the canal. In such strictures there is often considerable induration of the corpus spongiosum surrounding the obstruction, forming a firm zone of highly elastic tissue, which, although admitting of being stretched to a certain degree, yet, if farther dilatation be attempted, irritation will ensue, and the contraction

become worse. Where there is so much condensation of the corpus spongiosum, it cannot be expected that potassa fusa, or any caustic, can be safely applied for its entire destruction ; but a few mild applications of the potash will often so much lessen the irritability of the stricture as to permit the introduction of a moderate-sized bougie, so as to afford relief from all the more troublesome symptoms of the disease. It is fortunate that cases of this description are, comparatively, of rare occurrence ; but it is as well to know that there are such, which, whether we treat them by dilatation simply, by caustic, or by cutting, have so strong a disposition to re-contraction as to defy human skill to cure them. Some pains should be taken to ascertain the precise point to which these strictures will admit of being stretched without irritation, and then the bougie, having done all the good it can, should not be increased in size. Strictures in the straight part of the urethra, which consist principally of thickening of the mucous and submucous tissues of the canal, with but slight induration of the spongy portion, are, in general, just as easily removed by potassa fusa as those at the bulb.

Of all modern writers, Mr. Guthrie seems to have the most favourable opinion of the employment of caustic in strictures of the urethra, the *argentum nitratum* being that which he generally uses. Mr. Guthrie seldom has recourse to potassa fusa in stricture, preferring the *argentum nitratum* ; but, with his usual candour, admits that the former, when used in small quantity, is safer than the latter. From the whole tenor of this able surgeon's observations, it is evident that he thinks highly of the remedial powers of caustic in stricture, although, in compliance with prevailing prejudice, he seems to be a little coy in expressing the full extent of his affection.

My preference for the use of potassa fusa in the treatment of urethral obstructions, has arisen from a well-founded conviction, the result of ample experience, of its great superiority, both in safety as well as efficacy, to the argentum nitratum, when employed for the removal of the thickened tissues of a permanent stricture. I believe, also, that the former will, in most cases, prove quite as effectual, and commonly more so, than the latter, in the relief of spasm or irritation. I generally employ potassa fusa for the relief of irritation, instead of the nitrate, because, as was observed by Mr. Abernethy, when speaking of the two caustics in the treatment of stricture, "I think the kali a safer thing to use." Another reason for my having recourse to the potash, instead of the nitrate, to relieve irritation, is, that I find that the former has the additional advantage of more effectually opening the stricture than the latter. If, however, I had found the good effects of potassa fusa, in stricture, limited to the mere relief of irritation and spasm, the profession would never have been troubled with any observations of mine upon the subject; for it has always appeared to me that the great value of the caustic potash, in stricture, consists in its powerful solvent effect upon the tissues forming the obstruction. Of its great superiority, in this respect, to the nitrate of silver, I am, indeed, daily more and more convinced. In many cases of impassable stricture, by a judicious application of potassa fusa, the surgeon will be enabled, in a few days, or weeks at farthest, to get an instrument safely into the bladder. Indeed, I think that such will be the result in most cases; for, at present, as well as formerly, my experience leads me to conclude that the exceptions will be few.

In my remarks on the use of the argentum nitratum,

I have put in italics a passage from the work of Sir Everard Home, in which he observes, that in cases when the strictured part is so hard as not to be removed by the nitrate of silver, it is to be regretted that we have not a more powerful caustic, capable of being applied with safety to the urethra. I believe that the potassa fusa, so strongly recommended by his contemporary, Mr. Whately, is the very agent required by Sir Everard, although it would have been necessary to use it more freely than recommended by the former. My proofs for such assertion are, that I have succeeded, in similar cases, with caustic potash, after the nitrate of silver had failed. I have had no opportunity, by post-mortem examination, of ascertaining the appearance of the lining membrane of the urethra, in cases where strictures had been removed by potassa fusa. It will be seen that Sir Everard Home has stated that, on a post-mortem examination of patients, whose strictures had been destroyed by nitrate of silver several years previous to death, the part where the stricture had been had the same smooth appearance as the rest of the canal.

It would be productive of no useful purpose here to enter into the question of the re-production of mucous membranes, as it has been proved, in several instances, that the breach caused by their destruction has been repaired by a new formation, satisfactorily discharging all the functions of the original structure. It should also be borne in mind that, in bad cases of stricture, requiring the free use of caustic, the mucous membrane, at the seat of disease, has generally been so thickened by inflammation as to have retained but little of its healthy organization. Instead of having the polished surface and suppleness of healthy mucous membrane, it is, in fact, transformed into a rough, unyielding fibrous,

or fibro-semi-cartilaginous-like tissue. But discarding theory, of one fact I am certain, that, for all useful intents and purposes, in cases in which strictures have been removed by potassa fusa, the functions of the urethra have been as satisfactorily performed as when the obstruction had been treated simply by dilatation. It is well known that in cases of retention of urine from enlarged prostate, its middle lobe has sometimes been perforated by the catheter, and the patient has afterwards lived for months, or even years, without having again suffered from retention. The new channel made by the catheter has, in fact, answered every useful purpose of the original passage. Should the surgeon have well done his part of the work, in the removal of a bad stricture by the potassa fusa, he may rest assured that the resources of nature are amply sufficient for the substitution of a lining membrane for the enlarged channel, equal in utility, and less disposed to irritation, than that which had previously formed the internal coat of the contracted part of the urethra.

To bring the subject fairly before the reader, let us suppose that we have presented to us, for treatment, a bad case of stricture pervious to the urine, into which, however, no instrument can be made to enter without the employment of so much force as might lacerate the urethra. In such a case what is the best practice to be pursued? "That is the question." It may possibly be one of vital importance to the patient. Shall we adopt Dupuytren's favourite mode of proceeding, which he called vital dilatation? Shall we endeavour to overcome the obstruction, by making steady pressure against it for several minutes with a small metallic sound, and repeat the operation as often as prudent, with the hope of thus eventually getting an instrument

into the bladder? Or shall we have recourse to the application of caustic? I think it may be assumed, that division of the stricture either by the lancetted catheter, or by an incision in the perineum, will be justifiable only after the failure of less severe measures, except in extremely urgent cases.

With regard to the propriety of adopting the first plan, that of Dupuytren, my observations will be seen under the head of "Dilatation of Strictures by Retention of the Catheter." The second plan will, I know, occasionally succeed; but it requires for its success considerable tact, a light and steady hand, with a thorough knowledge of the passage to the bladder in all its various diseased obstructions and deviations. The instrument usually employed, indeed the only effective one for the penetration of an old hard stricture is a metallic sound, well rounded at its point, its size from No. 6 to No. 8; but the less the size the greater will be the chance of its causing mischief. Sir B. Brodie, it will be seen, has recommended the adoption of this plan, having himself employed it successfully in some difficult cases. I have used this method occasionally, with success, where there were false passages, in old hard strictures. It should not, however, be undertaken except by surgeons accustomed to the management of bad strictures, as it requires great care to succeed in getting an instrument into the bladder without either lacerating the urethra, or making false passages in it.

Sir B. Brodie, in his usual clear and graphic style, has certainly given us excellent rules for the employment of the sound in impassable strictures—a style, by-the-bye, well worthy of imitation, in which, as in a mirror, nature becomes truthfully reflected in all the lights and shades of disease. Notwithstanding, however,

the excellence of the rules given us for the management of the sound in impassable strictures, it will be found, in practice, that it is no easy matter to follow them, to know, in fact, what is the exact degree of force that can be employed with safety. It has been truly said, that "It is hard to stop at the precise point where the shade of a vice steals upon the brilliancy of a virtue." It is equally difficult, when endeavouring to pass a small metallic sound through an impassable stricture, to stop at the precise limits, which, if exceeded, that which was only a proper degree of force, may become injurious violence. To use such an instrument with safety to the patient will often tax to the utmost the skill of the most experienced surgeon.

The latter plan, the potassa fusa being the caustic employed, is the one which I commonly adopt in impassable stricture, from a conviction that it is, at all events, the safest, if not, as I certainly believe it to be, the most effectual for the relief of the patient in the majority of such cases.

It may be asked, how it is that others have not been equally successful as myself in the treatment of strictures with caustic. The principal reason of their failure is, I believe, that the nitrate of silver has been the caustic usually employed by surgeons, which, as previously stated, is far less efficient in its action than the potassa fusa. But, even supposing the caustic potash to have been the agent used, do we not constantly find in practice that a particular remedy proves more successful with one person than with another? Every surgeon well knows how much success depends upon the proper handling of a remedy. To use the potassa fusa successfully, in bad cases of stricture, often requires a considerable degree of confidence derived from long

experience in the good it is able to effect. It is, in fact, this faith and knowledge that will lead one person to persevere in the use of the potash, long after another would probably have thrown aside, from a feeling of disappointment, this truly valuable remedy.

The treatment of an impassable stricture, by the potassa fusa, will, for some little time, require much care on the part of the surgeon, as there are two things which he must more especially endeavour to avoid, viz., causing retention of urine and a false passage. The former will not be likely to occur, if the potassa fusa be applied at first in very small quantities, and only gentle pressure made with the bougie. It will be desirable that the patient should remain quiet for some few hours after its application, which can be managed by having recourse to the operation at bed-time, should his avocations prevent his resting during the day. With these precautions, the use of the caustic potash will usually diminish, instead of augment the disposition to retention of urine, its ordinary operation being that of a sedative, two or three applications often allaying irritation in a remarkable degree, by removing more or less the morbid sensibility of the stricture. To guard against making a false passage, if the armed bougie, when gently pressed against the stricture, should advance without being grasped, it should instantly be withdrawn, and, before the next application of the potash, it will be best to take an impression of the obstruction by the model-bougie; indeed, this may be often done advantageously at the commencement of the treatment, especially where there have been frequent unsuccessful attempts to pass instruments. When the armed bougie has fairly entered the obstruction, it should be gently pressed forward for a minute or two, so as to allow the

caustic to dissolve. In old cases, where the stricture is hard and gristly, subsequent experience has convinced me that a more free application of the potassa fusa can be advantageously made than in my former observations I ventured to recommend. I should, however, advise surgeons, not very familiar with the use of this caustic in bad cases of stricture, to be very careful to employ it only in small quantities. I should recommend them rarely to exceed a quarter, and never more than half a grain.

When using the armed bougie, it should be recollected, that the channel through which the urine passes, in these cases, is often irregular, and that the greatest care should, therefore, be taken to withdraw the instrument when not grasped ; or even then, if it be found to deviate beyond a slight degree from the natural course of the urethra ; for it should never be forgotten, that there are instances in which the bougie may be very firmly grasped whilst in a false passage.

In the application of potassa fusa to old gristly strictures, more or less mucous or muco-purulent discharge, with but little, and often no admixture of blood, is all the inconvenience that usually follows ; for, as to pain, there is commonly scarcely any of consequence. It will sometimes, however, happen that a patient experiences rather a sharp, scalding pain during the first act of micturition, after the introduction of the armed bougie ; to avoid which, in future, the patient should be desired to pass his urine just before the operation, so that some few hours may elapse before he requires to empty his bladder.

There are occasionally strictures so irritable, that when but gently pressed against with a bougie, more or less pain is experienced. In these cases, two or three applications of potassa fusa usually remove the irrita-

bility. I may here repeat, that no hæmorrhage of any consequence need ever be feared when the caustic potash is properly used. In no instance has this ever occurred, in my practice, nor, to my knowledge, has anything like a solid slough been caused in the great number of cases in which I have applied the remedy. When a stricture has become pervious, the armed bougie can then be advantageously passed slowly backwards and forwards over the whole inner surface of the obstruction. In the treatment of old hard impervious strictures with potassa fusa, it must not be expected that they are to disappear, like magic, by a few applications of the remedy. Such good fortune will seldom be obtained should the stricture involve more than a slight portion of the canal. The surgeon should, indeed, expect, in many of these cases, to find the obstructed passage so rugged and intricate that his progress to be safe must necessarily be also slow. If, after each application of the caustic, the bougie should be found to advance, however slightly, there will be good reason to expect that by a steady perseverance in the treatment, success will eventually be obtained, and this often in cases which appeared to be most unpromising.

It may now fairly be asked, what has been gained, after all this trouble and perseverance, which could not, very probably, have been accomplished in much less time by division of the stricture with a lancetted catheter, or by perineal incision? To which it may be answered, that the patient has, at all events, escaped an operation not always free from hazard, even if the dread usually entertained of such proceedings be accounted as nought; and should the potassa fusa eventually fail in clearing the way to the bladder, division of the stricture can then be practised. Of course,

in all cases of impassable stricture, it is possible that continued retention of urine may render imperative an immediate operation for its relief.

I believe, also, that in these cases, by the potassa-fusa treatment, the relief afforded will generally be more permanent than when incision of the stricture has been practised, to say nothing of the pain and irritation caused by retention of the catheter, often indispensable in the latter method of proceeding. After having succeeded, by the application of potassa fusa, in effecting a passage to the bladder, the remaining dilatation of the stricture can often be readily effected by the common bougie or sound, the latter being generally in hard strictures, as previously observed, by far the best dilating instrument. Should the obstruction, however, yield very slowly, much good will often be done by the occasional use of the potash. Where a considerable portion of the urethra is much thickened, and of a gristly hardness, it must not be expected that the whole of the diseased tissue can be safely removed by the caustic. I have generally found, however, that, after a free passage for the urine has been obtained by dilatation of the urethra to nearly its healthy size, the greater portion of the thickened tissue will gradually disappear; and, if the patient should prudently follow the direction of his surgeon in continuing regularly the use of the bougie or sound, the remaining part of the disease, with few exceptions, will eventually lose much of its disposition to contraction.

There are old strictures of small extent, varying from a slight annular obstruction to one of an inch or rather more in extent; and there are others, where the mischief is comparatively recent, but which often prove very troublesome from their extreme irritability. Such stric-

tures, I have good reason to believe, will be less likely to return when treated by potassa fusa, than when dilated with the bougie only, as the potash seems more effectually than the latter to remove the diseased tissue.

The objection urged by the opponents of the use of caustic in urethral obstructions, that its application has sometimes been productive of stricture, will, in general, be found to merit but little attention, being, with few exceptions, brought forward by gentlemen having no experience of the treatment which, following the fashion of the day, they think proper to condemn. It must be recollected that caustic of any kind is seldom used but in strictures of an unyielding character, except in cases where it is applied in a mild manner for the relief of spasm.

From long experience of the effects of the caustic potash when applied to urethral obstructions, I can confidently assert that it has evinced no tendency to the production or increase of stricture in the numerous instances in which the remedy has been used by myself; and I am moreover thoroughly convinced that there will be found less disposition to re-contraction in the more aggravated forms of stricture, when properly treated with potassa fusa, than when by dilatation simply.

The caustic potash has been of late years much more freely applied to the mouth of the womb, than it is required in urethral obstructions, and I am not aware of its having, in any single instance, caused a stricture of the os or cervix uteri. There are some interesting observations in the "Monthly Journal of Medical Science," for January, 1850, by Professor Simpson, who, when alluding to the application of nitrate of silver and potassa fusa to the small vesicular polypi of the cervix uteri, offers the following remarks, which so entirely accord with the results of my own experience of the effects

of those caustics in urethral stricture, that I have much satisfaction in quoting them :—

“To effect a complete cure, we require other means ; and for this purpose, the application of caustics to the mucous membrane of the cervix answers every indication. Nitrate of silver generally proves too weak for this purpose, unless repeated very often, and combined with scarifications of the mucous surface. We possess a far more potent and certain caustic for the purpose, and one that is perfectly manageable, in potassa fusa. The surface of the os and cervix, when small vascular polypi exist, are often found to be the seat of chronic inflammatory ulceration ; and sometimes the submucous tissue, and the structure of the cervix, are also the seat of chronic inflammatory hypertrophy and induration. When such a combination exists, the potassa fusa is doubly useful, as the application at once destroys the polypi, and sets up a new and healthy action in the affected and morbid tissues of the cervix.”

It will doubtless be thought by many persons that my account of the effects of the potassa fusa in stricture is much too favourable ; but nothing can be farther from my intention than to mislead others by an over statement of its powers in that disease. All I can say is, that it has less frequently disappointed me than most remedies. It is not, and never has been my intention to speak of the caustic potash as a specific in all cases of stricture. I am daily more and more convinced, however, that it is an agent of great value in the management of many cases of stricture, and that the surgeon who gives it a proper trial will very often be extremely gratified, and probably not a little surprised at its good effects. The fact is, that all the mischievous consequences caused by the nitrate

of silver, when injudiciously used, have equally, and according to my experience, most unjustly been attributed to the proper use of the caustic potash, such as inflammation, more or less severe, sometimes involving the prostate and bladder, abscesses, fistulous openings, false passages, and profuse hæmorrhage. How far in the hands of others, the improper use of the potassa fusa may have produced these accidents, it is, of course, impossible for me to say ; but in mine, its action has been of a mild character ; and having now used the remedy most extensively, I am perhaps entitled to speak with some degree of confidence upon the subject. All the ill effects which have occurred to me from the application of the caustic potash, shall now be fully stated. Let, then, the potassa fusa be arraigned, and tried upon the several indictments brought against the argentum nitratum in the treatment of stricture.

To the first charge, that of having caused inflammation of the prostate and bladder, I answer, Not guilty. To the second, that of having caused abscesses, my answer is, On one occasion only. This was the case of a dispensary patient of strumous habit, who had a hard irritable stricture at three inches and a half from the urethral orificē, and another at the bulb. At the commencement of the treatment with the potassa fusa, there was a considerable degree of hardness in the perineum. During the dilatation of these strictures, to which the caustic had been occasionally applied, an abscess formed in the perineum, which was opened ; it very soon healed, and did not appear to have any communication with the urethra. This man suffered much from hæmorrhoidal tumours ; and a few months after the formation of the first abscess, another formed, which communicated with the rectum. This was laid open with the bistoury. He

has long been well, but, by my advice, occasionally passes for himself a full-sized bougie.

I have mentioned this case, which occurred many years ago, as it is possible the abscess might have been caused by the caustic, although I believe it highly probable that, under any treatment, in such a strumous subject, with so much perineal hardness, suppuration would have taken place.

To the third charge, that of the production of fistulous openings and false passages, I can truly answer, Not guilty to my knowledge. It is, however, possible that on one or two occasions I may have made a false passage without being at the time aware of the circumstance. I have related one case of impassable stricture, treated by potassa fusa, where there was a false passage when the patient came under my care; and, notwithstanding all my precautions, the armed bougie would occasionally take the wrong direction, but was, of course, quickly withdrawn, without having done any perceptible harm. Let me, however, repeat, that very great care should always be taken where there are false passages.

To the last charge, that of having caused profuse hæmorrhage, I answer, without the slightest hesitation, Not guilty. Let it be remembered, however, that the above favourable account applies only to the careful application of the caustic potash, which it has been my constant endeavour to enforce, at the risk of being charged with tautology, considering the importance of the subject a sufficient justification for such repetition.

I have at this time under my care, a case in which there has long been a false passage, into which, for some years, instruments have been passed, in the supposition of their having been in the right direction. I was at first deceived in a similar manner, as the catheter was grasped firmly whilst in the false passage, communicat-

ing precisely the same sensation as when the instrument is passed through a hard stricture ; and it was only on finding it proceed as far as the bladder, that I became fully aware of the existence of a false passage. In this case, whatever may be the instrument employed, it is very difficult to avoid the false passage ; everything being sure to take that course unless great precaution be used. If the potassa fusa be used in such a case as this, it will be best to apply it in a silver canula containing a stilet, at the end of which is attached a small cup for the caustic, which is concealed within the canula until the instrument arrive at the stricture, when the stilet must be pushed forward. Should the obstruction be beyond the straight part of the urethra, a curved canula must, of course, be used.

Old, hard, narrow strictures, complicated with one or more false passages, are, undoubtedly, the most difficult of all to manage, often requiring great skill and caution in their treatment.

Having been by far the greater part of my professional life attached to an extensive public institution, where stricture cases are of frequent occurrence, I have had ample opportunities of witnessing the effects of different kinds of treatment in urethral obstructions. The result of my experience is, that more may be done in bad cases of stricture, with the least chance of injury, by a judicious employment of potassa fusa, than by any other means. Prejudice is, however, all powerful. I have often seen surgeons of high character, whose objections to the employment of caustic, in any form or quantity, were insurmountable, yet who did not hesitate to force a steel sound into the bladder at the cost of no slight degree of bleeding. Surely there was some little inconsistency in those who were so prejudiced against the use of caustic in any form, thus disregarding the

laceration and subsequent inflammation caused by their own practice. It must, however, be admitted, to borrow a military phrase, that there is more *éclat* to be obtained by forcibly entering the bladder by storm than by the more slow but often safer process of the mine.

It has indeed occurred to me to witness so many ill effects from the employment of what has at the time appeared a necessary degree of force in the dilatation of unyielding strictures, that I gladly have recourse to the assistance of potassa fusa in such cases.

I may here remark, that patients usually find so little inconvenience and so much advantage from the use of the caustic potash in these cases that they are generally anxious for its repetition.

It will be seen, on perusal of the cases, that I have alluded in several instances to the patients, before their application to me, having been treated for a long time by surgeons of high character, to prove that dilatation had received a fair trial previous to the use of the caustic alkali, to which remedy must entirely be ascribed my success where others had failed.

Many will, doubtless, be somewhat surprised at my having ventured, in some of the cases, to apply the caustic alkali daily. It must, however, be borne in mind that such cases were old strictures of a cartilaginous hardness, which are seldom much predisposed to spasm. The principal suffering of patients with such obstructions, is usually caused by the straining efforts of the bladder to force the urine through a highly contracted unyielding channel. The diseased tissue itself has commonly but little sensibility; indeed the free application of potassa fusa to its interior seldom causes pain worth mentioning. It is in these cases, where, from the strong contractions of the bladder, with its

muscular power frequently increased to a great extent, and where there must be constant apprehension of the yielding of the urethral canal behind the obstruction, that the caustic alkali will be found truly valuable. In such cases as these, when once the armed bougie has fairly entered the gristly mass, to obtain success, the caustic must be boldly and freely used.

I was happy to see that Dr. Gross, the distinguished professor of surgery in the University of Louisville has employed the potassa fusa in the treatment of stricture, and it affords me much gratification to quote the following passage from his work on "The Urinary Organs :—" "I have myself employed it (the potassa fusa) with the most happy effects, in cases in which the lunar-caustic had failed to afford relief. Much prejudice has existed in the minds of surgeons, because they seem to think that its application must necessarily be followed by a slough. Nothing can be more erroneous."

In concluding this subject, it may be as well to state that the method of treating strictures by potassa fusa was brought forward by me in a paper read at the Westminster Medical Society, on the 15th of February, 1840, having then for several years successfully employed that remedy in the treatment of stricture. My object in that paper was principally to show the great value of potassa fusa in impermeable strictures, and at the same time to define, with some degree of precision, the nature of the cases in which it would prove useful. I can truly say, that subsequent and far more extensive experience has increased my very high estimation of the admirable effects of the caustic alkali in the relief or cure of urethral obstructions. No remedy I have ever employed has afforded me so much satisfaction, and it has very often surpassed my expectations in the

speedy relief it has afforded in cases of the worst description.

Having now, to the best of my knowledge, given an accurate account of the effects of the potassa fusa as employed by me for more than twenty years in the treatment of stricture, I cannot but hope that my success may be the means of inducing others to avail themselves of the powers of this truly valuable remedy, and that I shall thus have contributed in some degree to the alleviation of human suffering.

CASES.

CASE I.—*Impassable Stricture.*

Mr. L. applied to me, July 20, 1827, under the following circumstances. He complained of great difficulty in making water, the urine passed generally by drops, or in a very minute stream, during the day, and was constantly dribbling away in the night. He attributes his disease to a gonorrhœa which he had contracted twelve years ago, having suffered more or less ever since ; but during the last two years his sufferings have been much increased from an almost incessant desire to pass his urine. On examination, a stricture was discovered about two inches from the orifice of the urethra, through which obstruction no instrument could be passed. The potassa fusa was applied to the stricture, and retained for two or three minutes. The potassa fusa was again applied on the 22nd ; and on the 24th a No. 2 silver catheter was passed through the stricture to the membranous portion of the urethra, but could not be got further. After having a little dilated the first stricture, a No. 4 bougie, armed with the potassa

fusa, was applied to the second stricture. Ten applications of the potassa fusa, at intervals of three or four days, were necessary before the second obstruction would yield, when a No. 2 silver catheter entered the bladder with some little difficulty, the instrument passing over a hard rough surface at the membranous portion of the urethra. The case was afterwards easily managed, the strictures having been gradually dilated by the introduction of steel sounds and silver catheters. On the 10th of November, a No. 13 steel sound was passed with facility. The patient called upon me occasionally during the following year, when the same sized bougie was used. He has never had any return of his disease; and at his request, about six months ago, I introduced a full-sized bougie into his bladder.

CASE II.—*Irritable Stricture, with Chronic Enlargement of the Testis.*

J. Collins, aged 30, residing at No. 40, Princes Street, Soho, admitted a dispensary patient, June 19th, 1834. He had for many months experienced great difficulty in passing his urine, which came away by drops and in a very small stream. The right testicle was much enlarged, with a schirrus-like hardness. On examination, a stricture was discovered at $6\frac{1}{2}$ inches, exceedingly irritable, and bleeding from very gentle pressure with the bougie, which did not enter the obstruction. Two grains of calomel, with a grain of opium, were ordered to be taken every night at bed-time; leeches to be applied to the perineum, and a belladonna plaster to the testicle, as the pain in that organ occurred in severe paroxysms. The potassa fusa was applied the following day, and repeated on alternate days, eight applications having

been necessary before a No. 2 bougie could be passed into the bladder. The urethra was then left undisturbed for a week, when a No. 3 bougie was readily passed, at which time the testicle had nearly recovered its healthy state. The size of the bougie was gradually increased to No. 12, and the patient was discharged.

CASE III.—*Irritable Stricture.*

Thomas Delaney, aged 28, admitted a dispensary patient, April 28th, 1836, with stricture of the urethra, which he attributed to a former gonorrhœa. He has for a long time passed his water with difficulty, the stream being very small and spiral, and has had several attacks of retention of urine. A No. 2 bougie was, with a little perseverance, passed into the bladder through two strictures, the first at two, the second at $6\frac{1}{2}$ inches. A week afterwards, the same sized bougie could not be made to enter the first stricture, which was very irritable. The potassa fusa was consequently applied; and after it had been used five times, a No. 4 bougie entered the bladder with facility. Nos. 5 and 6 were introduced at intervals of three days; after which, a muco-purulent discharge came on, which prevented further progress in the case for a month. After the cessation of the discharge, the strictures were gradually dilated so as to admit the introduction of a No. 11 steel sound, when the man discontinued his attendance at the dispensary.

CASE IV.—*Impassable Irritable Stricture.*

H. D., aged 40, a surgeons' instrument maker, admitted a dispensary patient, May 14th, 1835, with stricture of the urethra of twenty years' duration. He

had been under treatment several times, and the common caustic bougie had been occasionally used. A No. 3 silver catheter is the largest sized instrument he has ever had passed into the bladder, and its introduction was invariably followed by rigors and the loss of several ounces of blood. He has had frequent attacks of retention of urine, and his bladder was punctured in 1825. In 1828, after having suffered from complete retention of urine for three days, during which time no instrument could be passed, the urethra at length gave way behind the stricture, and extensive extravasation of urine occurred, from which attack he slowly recovered. For two or three years afterwards, abscesses occasionally formed in the perineum. At the period of his application to me his urine was passed with great difficulty, either by drops or in a very fine thread-like stream, seldom more than a tea-spoonful at a time; and his rest was much disturbed by an almost incessant desire to make water. On examination, a stricture acutely painful on pressure, was discovered at two inches from the orifice of the urethra, through which no instrument could be passed. At the seat of obstruction, externally, was a tumour of the size of a Spanish nut, and the corpus spongiosum at that part appeared to have been converted into a hard schirrous mass. Leeches were applied to the perineum, a dose of castor-oil was administered, and the following day the potassa fusa was used. The application of the potassa fusa was repeated every alternate day until the 24th, when a No. 2 elastic gum catheter was passed as far as the membranous portion of the urethra, where it was stopped by a second stricture. After two more applications of the potassa fusa to the first obstruction, a No. 4 bougie, armed with the potash, was passed to the second stricture. After three applications to the second contraction, a No. 2 elastic

gum catheter entered the bladder, and was retained for about two hours. The strictures were sufficiently dilated by the 5th of July to admit with facility the introduction of a No. 6 elastic gum catheter. As the patient made water in a tolerably good stream, and was disturbed but once during the night, he was so satisfied with his state, that I could not persuade him to allow me to proceed further in dilating his strictures. He promised me, however, to introduce the catheter occasionally, and declared that he had derived more benefit in the short time the potassa fusa had been used, than during the whole of the extended period through which other means had been adopted. The external hardness had entirely disappeared. This patient again applied to me about five weeks ago, in consequence of a slight return of his former symptoms. He had latterly for many months neglected to pass the catheter, and, on examination, I found the first stricture very irritable, and disposed to bleed on gentle pressure. The potassa fusa was consequently applied, and repeated at the end of three days, when a No. 3 elastic gum catheter entered the bladder. With the assistance of two more applications of the potassa fusa, a No. 5 elastic gum catheter was passed. Each application of the potash improved the stream of urine. The patient has now promised to continue the use of the bougie regularly.

CASE V.—*Impassable Stricture.*

Thomas Whitehead, aged 35, admitted a dispensary patient, March 10th, 1835, with stricture of the urethra, which he attributed to the use of an injection for the cure of a former gonorrhœa. On his application to me he had great difficulty in making water, only a

few drops passing at a time. He had for many months been obliged to rise very frequently during the night, from the urgent desire to pass his urine. He complained of much pain in the loins and region of the bladder. On examination, a stricture was discovered apparently at the commencement of the membranous portion of the urethra, which was impassable to the smallest-sized bougie. After the application of the potassa fusa, twelve leeches were put on the perineum. The potassa fusa was not again used for a week, until after the cessation of a muco-purulent discharge, slightly tinged with blood, which had succeeded its first application. After four applications of the potassa fusa, each of which had improved the stream of urine, a No. 2 bougie was introduced into the bladder, the instrument having been firmly grasped by the stricture. On the 28th, a No. 3 was passed; but the stricture being irritable and disposed to bleed, the potassa fusa was afterwards applied. The urethra was left undisturbed for a week, when a No. 4 bougie was readily passed. By the 16th of July, the stricture was sufficiently dilated to admit with facility the introduction of a No. 8 bougie; after which time the man discontinued his attendance at the dispensary, considering that he passed his urine as well as ever, notwithstanding the necessity of a further dilatation of his strictures was strongly urged upon him.

CASE VI.—*Inflammatory Spasmodic Stricture.*

Edward Jordan, aged 38, residing at No. 9, Middle Row, Holborn, admitted a dispensary patient, June 13th, 1835. He had experienced some little difficulty in making water for two months; but during the last

three days before his application to me, his urine had been passed only by drops. As no bougie could be passed beyond six inches, the potassa fusa was applied to the obstruction for two minutes, and immediately after the bougie had been withdrawn, he made water in a tolerable stream. As it appeared evident that the stricture was in a great degree spasmodic, I then introduced a No. 7 steel sound, about the size of the stream of urine, which readily entered the bladder. No further difficulty occurred ; but a slight discharge came on for three or four days, after which the size of the bougies was gradually increased ; and on the 18th of July, a full-sized steel sound was easily passed into the bladder.

CASE VII.—*Impassable Stricture from injury to the Urethra.*

Henry Hincks, aged 30, admitted a dispensary patient, Nov. 23rd, 1837, with stricture of the urethra. He complained of great difficulty in voiding his urine, which for some time past has been discharged by drops, or in a small, thread-like stream. The man attributed his disease to a fall from a horse, about four years before his application to me, when he was trampled upon, amongst other places, in the perineum. Immediately after the injury, blood flowed freely from the penis, the patient thinks, to the amount of a quart ; and for three or four days afterwards his urine was bloody. After having remained apparently well for two years, whilst leaping a horse without a saddle over a hedge, he was thrown forcibly forwards, and again injured his perineum. Profuse hæmorrhage from the urethra immediately ensued, and the urine continued bloody for a few days afterwards. About twelve months after the

last injury, he observed the stream of urine to be smaller, and the time occupied in emptying his bladder to be unusually long. The difficulty in micturition gradually increased, and in a few months' time, whilst straining to empty his bladder, something appeared to him to give way, when the urine flowed more freely. A purulent discharge from the urethra ensued, to which he has ever since been occasionally subject. The symptoms of stricture have been gradually becoming worse; and on his application to me, his urine was passed with very great difficulty, there being seldom more than a tea-spoonful or two voided at a time. On examination, an impassable stricture was found at $6\frac{1}{2}$ inches, to which the potassa fusa was applied. The potash was used every alternate day, and after the eighth application a No. 2 silver catheter entered the stricture, but was stopped by a second obstruction an inch beyond the first. The potassa fusa was applied to the last stricture; and three days afterwards, with a little perseverance, a No. 2 silver catheter was passed into the bladder. The stream of urine had been gradually improving during the use of the potassa fusa. No further difficulty in the treatment occurred, and on the 5th of February, 1838, a No. 12 steel sound was readily passed into the bladder. I have since, at distant intervals, passed the same sized instrument for him.

CASE VIII.—*Impassable Stricture.*

Thomas Baker, aged 45, admitted a dispensary patient, January 18th, 1838. Had experienced more or less difficulty in passing his urine for two years; and latterly it had been chiefly voided by drops. On examining the urethra, the smallest-sized bougie could not

be passed beyond $6\frac{1}{2}$ inches, and the pressure of the instrument caused free bleeding. The potassa fusa was applied for about two minutes. January 20th.—The urine has been passed this morning in a very small stream, with very frequent interruptions. The potassa fusa was again used, and its application repeated on the 23rd and 25th. On the 27th a No. 2 silver catheter was passed into the bladder. On the 30th, when endeavouring to introduce a No. 3 catheter, slight bleeding occurred; the instrument was consequently withdrawn, and the potassa fusa applied. After this time no further application of the potassa fusa was required, the stricture having gradually yielded; and on the 8th of March a No. 10 steel sound was readily introduced into the bladder. The man did not afterwards come to the dispensary.

CASE IX.—*Impassable Irritable Stricture.*

Michael Brookery, aged 30, residing No. 4, Lumbercourt, admitted a dispensary patient, February 2nd, 1839. This man had been subject to stricture of the urethra for nine years. The difficulty in emptying his bladder had latterly considerably increased; and, on his application to me, his urine was passed only by drops, after much straining. On examination, an impassable stricture was found at $6\frac{1}{2}$ inches, to which the potassa fusa was applied. It was necessary to repeat its application eight times between the 2nd and 28th, before an instrument could be passed through the stricture, when, on the latter day, a No. 2 silver catheter entered the bladder. The stricture yielded but slowly at first from its extreme irritability, arising most probably from the irregular habits of the patient.

The potassa fusa was again used on the 30th, and the urethra left undisturbed for a fortnight. After this time no further application of the potassa fusa was required, and on the 20th of June a No. 12 steel sound was passed without any difficulty.

CASE X.—*Impassable Stricture.*

William Cox, aged 52, residing No. 2, Green's-court, Christchurch, admitted a dispensary patient, October 15th, 1839. Has had stricture of the urethra fifteen years. The difficulty in micturition, from which he has long suffered, has latterly much increased; and during the last year his urine has been constantly dribbling away night and day. On examination the urethra was observed to be much contracted at its orifice from the cicatrix of a former ulcer, and an impassable stricture was discovered at seven inches, to which the potassa fusa was applied. Its application was repeated on the 17th and 20th. On the 22nd, a No. 2 silver catheter entered the bladder with some little difficulty, the strictured portion of the urethra appearing to be hard and cartilaginous. On the 24th, the man expressed himself as greatly relieved, having been able to retain his urine all night, and had passed it in a tolerable stream during the day. The stricture was sufficiently dilated by the 30th to admit the introduction of a No. 6 steel sound. The man's attendance at the dispensary has since been so irregular, that only the same sized instrument has been passed.

CASE XI.—*Impassable Stricture.*

John Glover, aged 46, residing No. 20, Great Chapel

Street, Soho, admitted a dispensary patient, July 19th, 1839, with stricture of the urethra, which he has had for nearly twenty years. He has for the last two years been annoyed by a constant dribbling of urine night and day. On examination, an impervious stricture, which bled on very slight pressure of the bougie, was found at seven inches from the orifice of the urethra. The potassa fusa was used; twelve leeches were ordered to be applied to the perineum, and twelve grains of Dover's powder to be taken every night at bedtime, with an occasional dose of castor-oil. After the fifth application of the potassa fusa, a No. 2 silver catheter entered the stricture, but could not be passed onward more than a quarter of an inch. The potassa fusa was used every second or third day until August 15th, when, with some little perseverance, a No. 2 silver catheter was passed into the bladder, the strictured portion of the urethra apparently extending an inch and a half, as it felt rugged and cartilaginous to that extent. Immediately after the catheter had been withdrawn, the man made water in a continued stream, the first time he had done so for many years. Considerable discharge and irritation ensued; and the nocturnal dribbling of urine, which had ceased after a few applications of the potash, again returned; but during the day the patient made water in a very small stream. The urethra was left undisturbed for three weeks, when a No. 2 silver catheter was with some little difficulty again passed into the bladder. A muco-purulent discharge ensued, which lasted four or five days, and the stream of urine improved considerably. The following week a No. 4 steel sound was passed. On the 17th of November, after the withdrawal of a No. 5 steel sound, which had been introduced into the bladder, a

small quantity of blood came away. The urethra was consequently left undisturbed for three weeks ; at the expiration of which period, a No. 6 steel sound was passed with ease.

December 30th.—The patient now passes his urine in a tolerable stream, and is seldom disturbed during the night. A No. 6 catheter was introduced, with some little difficulty. January 12th, 1840, the No. 6 catheter was passed ; but the stricture being irritable and disposed to bleed, the urethra was afterwards left quiet for three weeks. The stricture gradually yielded so as to admit, by the end of April, the introduction of a No. 11 steel sound. The patient occasionally comes to the dispensary to have the same sized instrument passed for him.

CASE XII.—*Impassable Stricture, with Anasarca and Albuminous Urine.*

Mr. T., aged 34, residing in Grafton Street, Soho, first applied to me, Sept. 6, 1839. His legs, thighs, and scrotum, were very greatly distended with serum, and the integuments of the lower part of the abdomen and loins also pitted on pressure. The patient informed me that he had suffered from stricture of the urethra for several years, and that very frequent, persevering, and painful attempts had been made to get an instrument into his bladder, but without success. His urine, which was highly albuminous, had latterly diminished in quantity, and for some length of time past had been voided with great difficulty, generally by drops, after much straining. The patient complained of no pain in his loins, or any other part ; the tongue was clean ; pulse seventy, without irregularity ; the

countenance had a slight hectic tint. On examining the urethra, the smallest sized bougie could not be passed beyond seven inches. The potassa fusa was applied, the legs and scrotum were punctured in several places, and diuretics with cathartics prescribed. On the 8th of October, after eight applications of the potassa fusa, a No. 2 silver catheter was, with some difficulty, introduced into the bladder, after gliding over a rough and gristly surface, apparently occupying the whole of the membranous portion of the urethra. At this time the swelling of the extremities had greatly subsided; the scrotum was nearly reduced to its natural size, and no œdema of the trunk remained. Steel sounds were introduced twice a week, and on the 6th of November a No. 6 was passed without difficulty, and the patient made water in a tolerable stream. The urine had increased in quantity, and contained much less albumen than when first examined. The patient at this time discontinued his attendance, and I saw no more of him until the 8th of July, 1840, when he again applied to me. He informed me that for the last two months his urine had passed less freely, the stream having become gradually smaller. On examination I found it impossible to pass a No. 3 silver catheter, the stricture being very irritable, and bleeding on very slight pressure. I therefore again had recourse to the potassa fusa, and, after four applications, succeeded in passing a No. 3 catheter, which was very firmly grasped. In the course of a month I was enabled to pass a No. 7 steel sound. A muco-purulent discharge, however, ensued, and the stricture became too irritable for some time to go on with its dilatation. I have since passed a No. 6 steel sound, but have not yet attempted to introduce one of larger size. The urine was examined a month ago, and was then free from albumen.

CASE XIII.—*Irritable Stricture.*

Edward Denyer, aged 26, admitted a dispensary patient, October 16th, 1839. He complained much of an aching pain which came on a short time before making water, and subsided immediately afterwards. The stream of urine was at times very small, occasionally divided, and frequently spiral. On examination a stricture was discovered at $6\frac{1}{2}$ inches from the orifice of the urethra. A No. 4 plaster bougie was passed with some little difficulty through the stricture, which was very irritable, bleeding on slight pressure. The same sized bougie was occasionally passed, but at times could not be made to penetrate the stricture. Finding no improvement after a month's trial with the common bougie, with the occasional application of leeches to the perineum, and administration of opium, I applied the potassa fusa three times, and afterwards passed a No. 5 bougie with facility. The stricture was sufficiently dilated by the 9th of January, 1840, to admit the introduction of a No. 10 steel sound. This patient had a very small urethra, which would not admit the introduction of a larger sized instrument.

CASE XIV.—*Irritable Stricture in which the introduction of Instruments caused great Constitutional Disturbance.*

Griffith Ridsdale, aged 47, residing No. 26, Gibraltar Row, West Square, Lambeth, admitted a dispensary patient, October 5th, 1839, with stricture of the urethra of many years' duration. His urine had long been voided with difficulty, frequently stopping suddenly,

then passing by drops, and for the last two months it has been constantly dribbling away night and day. He has been under surgical treatment many years, and he informed me that a No. 6 steel sound is the largest sized instrument that has been passed for him, a considerable degree of force having been always required before it could be got through the stricture, which invariably bled freely afterwards. Severe constitutional disturbance always succeeded the introduction of instruments, the patient usually suffering from vomiting and purging for twenty or thirty hours afterwards. On examination, a stricture was discovered at $4\frac{1}{2}$ inches from the orifice of the urethra, which was highly irritable, and bled freely on very slight pressure. A No. 6 bougie, armed with potassa fusa, was applied to the stricture for about two minutes; and was again used on the 10th. On the 26th a No. 6 bougie was passed into the bladder without any hæmorrhage. 29th.—No constitutional disturbance, or other ill effects, succeeded, as formerly, the introduction of the bougie; and the patient says he is better than he has been for many years. Dec. 17th.—The patient having been unable to attend since the 29th of October, I attempted to pass a No. 6 bougie, but without success. The potassa fusa was consequently applied, when, after about half a minute's pressure, the armed bougie passed through the stricture, and was of course instantly withdrawn. A No. 6 common bougie was immediately afterwards passed with facility, and retained a quarter of an hour. On the 2nd of January, 1840, a No. 9 elastic gum catheter, without its stilet, was readily introduced, and on the 15th a No. 10 bougie was as readily passed.

CASE XV.—*Impassable Stricture.*

Charles Fox, aged 40, admitted a dispensary patient, June 4th, 1840, with stricture of the urethra. His urine has long been passed with great difficulty, and the stream is very minute and divided. Abscesses have occasionally formed in the perineum, but without leaving fistulous openings. On examination, a stricture was discovered at six inches, which bled from very slight pressure with a No. 2 bougie, which could not be made to enter the obstruction. After three applications of the potassa fusa, a No. 2 bougie was passed into the bladder without any bleeding. No farther application of the potassa fusa was required, and in three months the stricture was sufficiently dilated to admit the introduction of a No. 12 steel sound.

CASE XVI.—*Irritable Stricture.*

George Tomkin, admitted a dispensary patient, Feb. 25th, 1840, with stricture of the urethra. His urine is passed with much difficulty, the stream being very small, frequently stopping and coming away by drops. On examination, a stricture was discovered at six inches, through which a No. 2 plaster bougie was passed with some difficulty. The man called at my house late in the evening, having been unable to pass any urine since the introduction of the bougie in the morning. No catheter could be passed, but the point of a No. 2 bougie was, after a little pressure, made to enter the stricture, and, when it was withdrawn, the urine followed in a very small stream. Feb. 27th.—As the urine had been dribbling away constantly since his last visit, the potassa

fusa was applied to the stricture, and, immediately after the bougie had been withdrawn, the man made water more freely than he had done for a month previously. Leeches were applied to the perineum, and the bowels well opened; after which the patient was ordered to take five grains of Dover's powder and ten of carbonate of soda three times a day. The potassa fusa was again applied on the 29th of February and on the 3rd of March. March 5th.—The stream of urine has much improved since the application of the potassa fusa. A No. 4 bougie was passed into the bladder. The stricture gradually yielded without any further application of the potash, so as to admit, on the 9th of June, the introduction of a No. 8 steel sound, at which time the patient was obliged to go into the country. He, however, returned to the dispensary, when I again had recourse to potassa fusa with great advantage.

CASE XVII.—*Impassable Stricture.*

John Williams, aged 36, residing at No. 16, Archer Street, admitted a dispensary patient, March 24th, 1840, with stricture of the urethra. This man has had an occasional gleet discharge, with difficulty in passing his urine, for the last two years. On examination, an impassable stricture was found at $6\frac{1}{2}$ inches. After three applications of the potassa fusa, a No. 2 silver catheter was passed into the bladder. The stricture gradually yielded without any further use of the potash, and was sufficiently dilated by the 29th of August to admit the introduction of a No. 12 steel sound.

CASE XVIII.—*Impassable Stricture.*

John Healy, aged 30, admitted a dispensary patient, June 25th, 1840, with stricture of the urethra. His urine is passed with great difficulty, either by drops or in a very fine stream, and the man is obliged to rise during the night to make water. On examining the urethra, an impassable stricture, which bled freely on slight pressure, was discovered at $5\frac{1}{2}$ inches. After three applications of the potassa fusa, a No. 2 silver catheter was passed into the bladder. No return of bleeding from the pressure of the bougie occurred after the first application of the potash. The stricture gradually yielded so as to admit, by the 20th of September, the introduction of a No. 11 steel sound. During the process of dilatation, in consequence of occasional irritability, the stricture was touched two or three times with the potassa fusa.

CASE XIX.—*Irritable Stricture.*

Eugene Connor, aged 31, residing at No. 11, St. Ann's Court, admitted a dispensary patient, June 3rd, 1840, with a stricture of the urethra. This man has been many years affected with stricture, and has latterly passed his urine with great difficulty. After considerable perseverance I succeeded in getting a No. 2 silver catheter into the bladder. The stricture, which was at the posterior part of the bulb, felt hard and rugged, and bled rather freely. June 28th.—A No. 3 catheter was passed with difficulty, being very firmly grasped, and when withdrawn was followed by a little blood. July 2nd.—The No. 3 catheter could not be

made to enter the stricture, the potassa fusa was therefore applied, and was again repeated at the end of three days. After this time there was no farther difficulty experienced in the dilatation of the stricture, which, on the 10th of August, admitted the introduction of a No. 10 steel sound. The man's attendance at the dispensary has since been so irregular, that no attempt has been made to increase the size of the instrument.

CASE XX.—*Impassable Stricture.*

John Sanderson, aged 43, admitted a dispensary patient, November 20th, 1839, with stricture of the urethra, accompanied by a slight gleet discharge. The urine was passed with great difficulty, the stream being very small and divided. On examination, an impassable stricture was discovered at seven inches, which bled on slight pressure from the bougie. After four applications of the potassa fusa, a No. 2 silver catheter was passed into the bladder. No farther application of the potassa was required, and by February 11th, 1840, the stricture was sufficiently dilated to admit the introduction of a No. 12 steel sound.

CASE XXI.—*Impassable Irritable Stricture.*

Robert Taylor, aged 32, admitted a dispensary patient, April 16th, 1840. This patient first observed a difficulty in passing his urine twelve months ago, which difficulty has gradually increased to the present time, and it is now voided only by drops, with great pain. Before his application at the dispensary, he applied to a surgeon, in consequence of retention of urine. An unsuccessful attempt was made to pass a catheter

which could not be made to enter the stricture. According to his account, he lost a considerable quantity of blood, which, with the medicines that were given to him, afforded slight relief, the urine passing again by drops as before. A second attempt was made to pass a catheter, which was also unsuccessful, and caused a greater loss of blood than the first. He then came to the dispensary, and, on examination, an impassable stricture was found at $5\frac{1}{2}$ inches, which bled from very slight pressure. The potassa fusa was applied to the stricture; leeches were directed to be put on the perineum, which was afterwards to be well fomented. The bowels were freely opened, and, afterwards, five grains of Dover's powder and ten of carbonate of soda were ordered to be taken three times a day. It required sixteen applications of the potassa fusa before any instrument could be passed, when, with some difficulty, a No. 2 silver catheter was got into the bladder. The stricture was long and very hard, feeling like cartilage, and the catheter was firmly grasped.

In this case, as in many others, I regretted exceedingly that the patient's necessary avocations would not permit me to leave the instrument in his bladder. This stricture was so irritable and unyielding, that, with great difficulty, it was sufficiently dilated by the 16th of July to admit the introduction of a No. 6 steel sound, and it has been necessary to have recourse to the potassa fusa occasionally, which has invariably afforded great relief. I have not yet been able to get beyond a No. 6; for whenever an attempt has been made to pass a No. 7, so much local irritation, accompanied by severe rigors, ensued, that matters were rendered worse for a time. The patient now passes his water in a very good stream, but cannot bear the introduction of a larger sized in-

strument than No. 6. This was a case in which the retention of a catheter in the bladder would, in all probability, have been attended with good effects ; but such a practice could not be pursued, and the patient was obliged to earn his living, and had to stand the greater part of the day.

CASE XXII.—*Impassable Stricture, with Fistulæ in Perineo.*

Charles Rowley, aged 42, residing in Monmouth Street, admitted a dispensary patient, December 14th, 1839, with stricture of the urethra, and three perineal fistulæ, through which the greater part of the urine is passed. About six years ago he first observed some difficulty in making water, which, from that time, so much increased, that in five months afterwards the man was admitted into St. Bartholomew's Hospital with retention of urine, which was succeeded by rupture of the urethra. Free incisions were made, and he was enabled in three months to leave the hospital. For two years after the rupture of the urethra, the patient was able to pass his water in a very small stream ; but was obliged, some time afterwards, to return to the hospital with retention of urine and a swelling in the perineum. A free incision was made, and the urine escaped through the opening. Since the last incision, the greater part of the urine has come away from fistulous openings in the perineum, and is at present passed in very small streams, chiefly by the fistulæ. A great number of unsuccessful attempts have been made to get an instrument into the bladder. On examination, the smallest sized bougie was stopped at six inches, and could not be made to enter the obstruction. The bowels were

freely opened, and leeches applied to the perineum; after which five grains of Dover's powder, with ten of carbonate of soda, were ordered to be taken every four hours. Severe rigors occurred after the examination of the urethra, which the patient informs me has been the case for some time past, whenever attempts have been made to pass an instrument. The potassa fusa was applied to the stricture, and its application repeated on the 21st, the 24th, and 26th. The report on the last day states that the urine passed in an improved stream by its natural channel. The potassa fusa was repeated on the 28th and 31st. On the 2nd of January, 1840, a No. 2 silver catheter was passed into the bladder with some little difficulty, and when it was withdrawn, about a tea-spoonful of blood escaped. The man's avocations would not permit me to leave the catheter in the bladder. January 5th, a No. 3 silver catheter was passed, and on the 8th, a No. 4 was introduced after considerable perseverance, the instrument having been very firmly grasped by the stricture. February 11th.—The stricture admits, with difficulty, the No. 4 silver catheter; but the stream of urine has much improved, and the fistulæ are nearly closed. In consequence of the irritability of the stricture, and the frequent occurrence of rigors after the introduction of instruments, the potassa fusa was again applied. February 13th.—No rigors occurred from the application of the potassa fusa, which was repeated this day, and also on the 16th and 20th. On the 24th, a No. 4 plaster bougie was passed without difficulty into the bladder. March 5th.—No irritation succeeded the last introduction of the bougie; but on attempting to introduce a No. 5 this day, the instrument was so firmly grasped by the stricture, that it could not be passed on into the

bladder. As the strictured portion of the urethra felt hard and rugged to some extent, the potassa fusa was applied. March 7th.—A No. 5 bougie was passed to-day; and on the 18th, the same sized silver catheter was introduced. The stream of urine has greatly improved, and the patient is obliged to rise during the night to make water, which he did not do formerly, as the greater part dribbled away by the fistulous orifices. A considerable muco-purulent discharge occurring at this time, the urethra was left undisturbed until June 6th, when a No. 6 steel sound was passed into the bladder. From this time no further difficulty occurred, the stricture gradually yielding so as to admit, by August 15th, the introduction of a No. 11 steel sound. A probe armed with nitrate of silver was introduced two or three times into one of the fistulæ which did not seem disposed to close. The fistulous openings are now all closed, and the patient comes to the dispensary occasionally to have a bougie passed.

CASE XXIII.—*Irritable Impassable Stricture treated by the potassa fusa.*

W. K., Esq., of middle age, applied to me, Dec. 31, 1840, with strictures of twenty years' duration. His urine, which was highly alkaline, had long been voided with great difficulty. He had been subject to occasional and severe attacks of retention of urine, and all attempts to get an instrument into his bladder had been, for a long time past, unsuccessful. The attacks of retention had been always attended with rigors and considerable constitutional disturbance. This gentleman was of a very nervous, excitable temperament, and much dreaded any attempt to pass a bougie, as all operations

of the kind had latterly been followed by rigors and retention of urine. He was taking the nitro-muriatic acid, which was continued. I found, on examination, that a No. 2 bougie was stopped at four inches, by a stricture, to which the potassa fusa was at once applied. Jan. 2nd.—The No. 2 bougie passed through the first stricture as far as six inches, where it was stopped by a second, to which the potassa fusa was also applied. This second stricture was very irritable, and three or four drops of blood came away when the bougie was withdrawn. The armed bougie was used again on the 5th and 7th. No rigors had yet occurred from these operations, nor any retention of urine. As, however, a rather free mucous discharge had ensued from the last application of the potash, the urethra was left undisturbed for a week. 14th.—The mucous discharge has entirely ceased, and the stream of urine perceptibly improved during the last two days. The potassa fusa was applied only to the second stricture, as the first had yielded considerably. 15th.—I was sent for early this morning to visit my patient, who was staying in the city, and found him much alarmed by a return of his rigors, which had occurred soon after he had voided his urine at bed-time. I was, however, pleased to find that the water had been passed more freely than for some length of time previously. An opiate was ordered, and when he again called upon me, which was on the 19th, I learned that there had been no recurrence of the rigors since my visit; also that the stream of urine was improving. The potassa fusa was used, and its application repeated on the 25th, the 28th, and on the 3rd, 8th, and 12th of February, when the patient informed me that urgent business rendered it necessary for him to return to the country. At this time the

bougie had advanced about a quarter of an inch into the second stricture, and the stream of urine was progressively improving. I wrote to the surgeon under whose care my patient previously had been, and advised him to continue the use of the armed bougie. A few days afterwards I received a letter from that gentleman, in which he informed me of his having succeeded in passing a No. 5 bougie into the bladder, after one application of the potassa fusa, the armed bougie having, in fact, passed through the stricture. I heard long after this, from a friend of Mr. K.'s, that his stricture continued so irritable, that he became dissatisfied with his progress, and discontinued the use of the potassa fusa. I believe he has since applied to some other surgeon. Although this case cannot be considered a successful one, yet it is not less instructive on that account. It certainly illustrates the powers of the caustic potash in overcoming a highly irritable impassable stricture ; also, the slight irritation caused by the remedy. For, whereas rigors, and often retention of urine, had for some length of time almost invariably succeeded the introduction of the common bougie, yet the rigors occurred only once, and the retention not at all, from the application of the potassa fusa. The principal difficulty of the case had ceased after the introduction of the No. 5 bougie into the bladder, but most probably the highly alkaline urine, to which this patient was so predisposed, passing over a very irritable stricture, was the cause of the little progress subsequently made in the treatment. In this case a gum elastic catheter should have been kept in the bladder, or, at all events, in the urethra, for some little time ; and then there would have been but little doubt, that with strict attention to the state of the urine and digestive organs, the subsequent dilatation might have been

eventually accomplished. It is, however, difficult to keep patients under these circumstances, for where but slight progress is made towards improvement, they, perhaps very naturally, seek other advice. I have since heard that this patient eventually submitted to perineal section, according to Mr. Syme's method, which afforded him, for a time, considerable relief. It appears, however, that the relief was not of long duration, as the stricture gradually recontracted, causing a return of his former sufferings. His case must therefore be regarded as one of those highly contractile strictures which no treatment can cure.

CASE XXIV.—*Old Stricture impervious to Instruments, with a false passage.*

Mr. D., about fifty years of age, applied to me, May 4th, 1841. He had long experienced great difficulty in passing his water, having had stricture for twenty years. He told me that no instrument had been ever got into his bladder, notwithstanding a great many attempts to effect that object had been made, and that he was sure he had a false passage. On examining the urethra with a No. 2 silver catheter, it was stopped at $6\frac{1}{2}$ inches, very slight pressure having caused free bleeding.

May 6th.—On introducing a No. 3 bougie to mark the exact distance of the stricture, before applying the potassa fusa, I found that it readily passed to eight inches, and that the instrument was not grasped. Feeling convinced that the false passage had been entered by the bougie, it was immediately withdrawn, and one more curved used. Keeping this well to the upper surface of the urethra, it was stopped at $6\frac{1}{2}$ inches as at first. I ascertained that the false passage commenced at the lower part of the stricture, taking its

course along the right side of the urethra. I applied the potassa fusa very carefully, and after the second application, a No. 3 bougie advanced half an inch into the stricture, being there firmly grasped. It required fifteen applications of the potassa fusa before a bougie could be passed into the bladder. The stricture, which at first bled freely on slight pressure with the bougie, ceased to do so at all after eight applications of the potassa fusa, the stream of urine having begun to improve after the fifth. The stricture soon became sufficiently dilated to admit a No. 8 bougie, when the patient discontinued his attendance. Notwithstanding the greatest care was taken to avoid such an occurrence, the bougie two or three times entered the false passage, but was, of course, instantly withdrawn.

CASE XXV.—*Irritable Hæmorrhagic Stricture.*

A gentleman, 40 years of age, applied to me on the 1st of April, 1841. He had been troubled with a stricture of the urethra for several years, accompanied with occasional attacks of retention of urine, which were invariably relieved by the introduction of a small bougie. On examination, I found an obstruction at the bulb, through which, after a little pressure, a No. 6 bougie passed into the bladder. From the patient's urgent desire to pass his water, the bougie could not be retained more than two minutes; and, when it was withdrawn, about a tea-spoonful of blood followed; a similar discharge having occurred whenever instruments had been introduced. The application of leeches to the perineum, and the exhibition of antispasmodic medicines, had no effect in diminishing the irritability of the stricture. After several unsuccessful attempts to dilate the

stricture with the common bougie, its extreme irritability not admitting a larger size than No. 6, my patient at length permitted me to use the potassa fusa, to which he had previously objected. Three days after the first application of the potash, a No. 6 bougie was passed with much less pain than before, and was retained for ten minutes. After four more applications of the potassa fusa, at intervals of four days, a No. 8 bougie could be readily passed without subsequent hæmorrhage or irritation. As the stricture from this time readily yielded, admitting a larger bougie at each successive introduction of the instrument, until one of full size could be passed without the slightest difficulty, there was of course no advantage in the farther application of the potassa fusa. I may add, that the remedy had so entirely removed the irritability of the stricture, as well as its disposition to bleed, that latterly the bougie was retained half an hour without causing any uneasiness.

CASE XXVI.—*Stricture from injury of the Perineum, impassable to Instruments.*

R. B., Esq., 45 years of age, applied to me in October, 1841. He had been a great sufferer from stricture of the urethra, which he attributed to an injury of the perineum, received at college whilst playing at foot-ball. This gentleman had long passed his urine with extreme difficulty, and was very much depressed from the supposition that his disease was irremediable. He had been under the care of a relative, who had for five months persevered in attempts to relieve him, but never could succeed in passing the smallest bougie. On examination, I found the urethra to be highly sensitive, and the smallest bougie was stopped at four inches. I at

once applied the potassa fusa, and, after four applications, a No. 3 bougie was passed on to six inches, but could not be made to advance farther, being very firmly grasped. This stricture, which was very irritable, required several careful applications of the potassa fusa before it yielded so as to allow a No. 4 bougie to pass on into the bladder. The stream of urine had much improved after the third application of the potash to the second stricture. This gentleman could not remain under my care for more than six weeks, being obliged to return to his residence at a considerable distance in the country. When he left me I could pass a No. 8 bougie. He was strongly urged to continue regularly the use of the bougie; but as he had a small urethra, I did not advise him to increase the size of the instrument beyond a No. 9. Being desirous to ascertain this patient's present state, I wrote to him; and, in answer to my letter, he informed me, in a note dated March 21, 1849, that he has never experienced any inconvenience in passing his water since he was under my care, but that he occasionally passes a No. 8 bougie.

CASE XXVII.—*Hard Impassable Stricture.*

J. O. H., Esq., 29 years of age, had two years before his application to me, been subject to occasional attacks of gleet, with more or less difficulty in voiding his urine. He had also, during that time, been much troubled with pain in the loins, perineum, and thighs. An examination of the urethra disclosed a stricture at $2\frac{1}{2}$ inches, impassable to the smallest bougie. Mr. H. had been relieved from one or two attacks of retention of urine by the gentle and continued pressure of a bougie against the stricture. Having made two or three unsuccessful

attempts to get a bougie through the stricture, I applied the potassa fusa on the 27th of October, 1844, repeating its application on the 29th, and on the 1st of Nov., when a No. 3 bougie passed through the stricture, but was stopped at $4\frac{1}{2}$ inches. After four applications of the potassa fusa to the second obstruction, a No. 4 bougie was passed on into the bladder. No other inconvenience, beyond a slight discharge of mucus tinged with blood, was caused by the potash. After the second application of the armed bougie to the stricture at $4\frac{1}{2}$ inches, the stream of urine began to improve. As the second stricture, which was an inch in length, and of a cartilaginous hardness, remained very undilatable, not permitting the introduction of a bougie larger than No. 4, I once more applied the potassa fusa, on the 28th of November, slowly passing the armed bougie backwards and forwards through the whole length of the obstruction. I did not again apply the potassa fusa, as the stricture was at length dilated, although slowly, by the use of the silver sound, so as to admit the introduction of a No. 13, which size I occasionally pass without any difficulty, although a part of the hardened tissue of the stricture remains.

CASE XXVIII.—*Impassable Stricture.*

John Foy, aged 35, applied at the dispensary on the 28th February, 1843. Has long suffered from a difficulty in passing his water, having been latterly disturbed several times during the night, as well as day, from an urgent desire to empty the bladder. The urine now comes away by drops, or in a very fine stream. Rigors frequently occur. Several unsuccessful attempts have been made at various times to pass a bougie, which attempts, it appears, invariably caused pain and a free

discharge of blood. On examination, a stricture was detected at $4\frac{1}{2}$ inches impassable to the smallest bougie, very gentle pressure causing a little oozing of blood. I applied the potassa fusa on the 2d of March, and after three applications, a No. 3 bougie was passed into the bladder. At the end of a month, the stricture admitted the introduction of a No. 8 bougie, and the man considered himself so well, that he did not continue his attendance at the dispensary. This case is an example of many others, in which patients, especially of the poorer classes, suffering from strictures, as soon as they are sufficiently relieved as to be able to pass their water in a fair stream, discontinue their attendance upon the surgeon.

CASE XXIX.—*Irritable Stricture.*

Mr. W., of middle age, had long suspected that he had stricture of the urethra, having for some length of time observed some yellowish spots upon his linen; also, that he occasionally passed his urine with a little difficulty. He had felt at times an aching pain in the perineum; but from the gradual diminution in the stream of urine, was not aware that it was much smaller than in the healthy state. With some slight difficulty, on the 27th of Jan. 1845, I introduced for this gentleman a No. 4 bougie. There was a stricture at the bulb half an inch in length. Finding, from the irritability of the stricture, that no progress had been made, on the 13th of February I applied the potassa fusa, and repeated the remedy on the 15th, 17th, 19th, and 21st, when I could pass a No. 6. The urethra was now left quiet for several days.

March 1st.—As the No. 6 bougie entered the stricture

with rather more difficulty than when last used, and the gentleman being very anxious to get entirely rid of his disease, having no fear of the remedy, I applied the potassa fusa more freely, passing the armed bougie slowly backwards and forwards along the obstruction. The only inconvenience caused by this application was a severe scalding pain felt by the patient when first passing his water afterwards, and a slight bloody mucous discharge, which continued for ten days. At the expiration of that time, the stream of urine had greatly improved. No attempt was made to pass a bougie until all urethral irritation had subsided, when a No. 8 was easily introduced. The stricture appeared to have been completely removed by the last application of the potassa fusa, as no difficulty was subsequently experienced, the size of the instrument having been gradually increased to a No. 16 silver sound. I have seen this gentleman frequently, and it is his conviction that the obstruction was entirely removed by the last rather free application of the potassa fusa. He, however, occasionally passes the No. 16 sound.

CASE XXX.—*Irritable Stricture.*

John Gatey, aged 39, admitted a dispensary patient, May 15, 1845. Has for some length of time past experienced more or less difficulty in micturition, and is obliged to rise several times during the night for that purpose. His urine is passed in a very fine stream which frequently stops, and requires much straining for its expulsion. On introducing a No. 2 bougie, it was stopped at $6\frac{1}{2}$ inches, but after a little pressure, passed on into the bladder.

18th.—The stricture was very irritable, the No. 2

bougie having been passed with greater difficulty, and causing more pain than at first. I therefore applied the potassa fusa.

22nd.—I again used the caustic potash, and on the 28th was enabled to pass a No. 5 bougie with less pain and spasm than had been previously caused by the No. 2. After the second application of the potassa fusa, the stricture was rapidly dilated so as to admit, on the 24th of June, the introduction of a No. 16 steel sound.

CASE XXXI.—*Irritable Stricture removed by the potassa fusa after failure with the nitrate of silver.*

T. R., Esq., about 30 years, residing in the country, first applied to me April 20, 1848, having been for some time past much troubled with a stricture of the urethra. Has had gonorrhœa three times, and dates the origin of his present complaint to the last attack, which he endeavoured to cut short by a strong nitrate of silver injection, made with a scruple of the salt to an ounce of water. He used the injection frequently, but did not continue it more than two days, from the severe pain and scalding that ensued. His disease was not cured by this remedy; indeed he has never since been entirely free from a gleety discharge. It was about eight months after the commencement of the last gonorrhœa, that he first observed a diminution in the stream of urine, to which, however, he paid no attention for twelve months, when his surgeon succeeded, with some difficulty, in passing a No. 5 silver catheter into the bladder. The introduction of the instrument caused much pain, and was followed by a little bleeding. The stricture was at length dilated by the plaster bougie sufficiently to admit a No. 13, but the introduc-

tion of the latter caused severe pain and a discharge of blood. To remove the irritability of the stricture, and to stop the gleet discharge, the nitrate of silver was applied six times, with Lallemande's instrument, at intervals of five days, the first application having been made on the 20th of December, 1847. The caustic did rather harm than good, as No. 10 is the largest sized bougie which has been passed since its use. It should be stated, however, that although a No. 13 had been passed two or three times, that size could not be gone on with, as the stricture became so irritable for some time afterwards, as to admit with difficulty the introduction of a No. 6 or 8. Under these circumstances, the gentleman, by the advice of his medical attendant, consulted me.

On the 20th of April, 1848, I passed, with a little resistance, a No. 8 silver sound through a stricture at five inches. On the following evening, a No. 6 could not be passed with any moderate pressure; I therefore at once applied the potassa fusa.

22d.—The armed bougie was passed slowly backwards and forwards through the stricture, which was about half an inch long, and felt hard. The potassa fusa was applied daily until the 27th, when a No. 11 silver sound was passed with facility. The stricture now readily yielded, and on the 7th of May, I was able to pass a No. 14 sound, which was the full size of the urethra. The application of the potassa fusa afforded so much relief, and time being a great object with my patient, that I did not hesitate to use the potash daily. The gleet discharge had almost entirely disappeared until the introduction of No. 14, which appeared to cause it to return slightly. Scarcely any pain on micturition was experienced during the treatment, a circumstance

which very much surprised the patient, who had suffered so much in that respect after the application of the nitrate of silver. When this gentleman left town, on the 12th of May, the morbid tissue forming the stricture appeared to have been removed, as no difference when passing the sound was felt between the part which had been obstructed and the other portions of the urethra.

CASE XXXII.—*Return of an Impassable Stricture from discontinuing the use of the bougie before the disease had been half cured.*

Thomas Whitehead, aged 49, formerly under my care, applied to me again on the 25th of July, 1848. He is now able to pass his urine only by drops, and that often with great straining, being obliged to rise several times during the night, from an urgent desire to empty his bladder. I learned that he continued to pass his water very well until four years ago, when he observed a slight difficulty in that act, which has been gradually increasing to the present time. Being unable to get a bougie beyond $6\frac{1}{2}$ inches, I at once applied the potassa fusa, and on the 27th repeated its application.

July 29th.—The urine has been passed during the last two days in a very small stream—the potassa fusa was applied.

August 1st.—The stream of urine has considerably improved, and the man was not obliged to rise to empty his bladder last night. I had no difficulty in passing a No. 3 bougie.

September 5th.—The size of the bougie has been gradually increased to No. 9.

Oct. 14th.—Not having been able to get beyond the No. 9, I applied the potassa fusa to-day.

Dec. 18. —A No. 12 was passed with facility, that being the full size of the urethra. This man has since occasionally attended at the dispensary, to have the No. 12 passed.

CASE XXXIII.—*Impassable Stricture.*

Mr. C. S., aged 34, residing in Gresse Street, admitted a dispensary patient, July 18, 1848. This person has for several years suffered much from a difficulty in passing his water. The stream is very small, and at times there is great straining before a drop can be passed; and so considerable, at times, are the efforts required to effect the expulsion of the urine, as to cause a discharge of blood. There is seldom more than half a tea-cupful of water passed at one time; and on some occasions, when unable to expel any, he has succeeded in effecting his object by the application of hot fomentations. This man had been an out-patient at an hospital, and the surgeon to the institution having failed in many attempts to pass an instrument, told him that his only chance of relief was to have an operation performed for the division of his stricture, and wished him to enter the house at once. Under these circumstances, he was advised by a friend to place himself under my care. He attributes his stricture to gonorrhœa, having had that complaint three times; the last having been very protracted. He has for some time past had more or less gleety discharge, and is troubled with a desire to pass his water almost every hour, being obliged to rise several times during the night for that purpose. His general health has become much impaired, and he suffers greatly from pains in his loins and thighs. On examination I found a stricture at the commencement

of the membranous portion of the urethra, which bled on very slight pressure, and the point of the instrument could not be made to enter the obstruction. As the stricture had latterly been much irritated by attempts to pass instruments, I thought it best to endeavour to relieve the irritation, by the application of leeches to the perineum, warm fomentations, &c., before resorting to the caustic potash, which was used on the 22nd, the result being the discharge of a few drops of blood and a sense of scalding when the urine was first passed after its application. The potassa fusa was again applied on the 24th ; and on the 27th I succeeded in passing a No. 3 bougie into the bladder.

August 3rd.—Not being able to pass the No. 3 bougie to-day, I applied the potassa fusa.

August 7th.—Applied the potassa fusa. The urine has considerably improved, and he has not been disturbed during the last two nights by any desire to empty his bladder.

August 9th.—Passed a No. 5 bougie into the bladder.

September 27th.—As the stricture continued unyielding to the common bougie, not admitting one larger than No. 7, which was firmly grasped, I again had recourse to the caustic potash. The gleet discharge has nearly disappeared, and there is no remaining difficulty in micturition. There was no occasion for any farther use of the potassa fusa, as the stricture gradually yielded so as to admit, on December 1st, of the introduction of a No. 12. I have not increased the size beyond 13, as that is as large as the urethra. The patient comes to me about once a fortnight, when I pass for him the No. 13, without the slightest difficulty, but the thickened tissue is not yet entirely removed, and it will be necessary for him to continue the regular use of

the bougie for some length of time. I have alluded to the proposed operation for division of the stricture in this case, as illustrative of the power of the potassa fusa, and not to intimate any superior skill on my part, as had it not been for that remedy, I could not have succeeded any more than others without recourse to the knife. I have been equally successful in the use of the caustic potash in many similar cases where the operation for division of the stricture had been proposed by other surgeons.

CASE XXXIV.—*Impassable Gristly Stricture of long duration.*

At 2, P.M., on the 12th of January, 1849, I was requested to see L. W., Esq., of middle age, who was in great suffering from retention of urine. He had passed only a few drops of water for the last twelve hours, and appeared to be greatly alarmed at his situation, from his knowledge of the impossibility of obtaining relief by the introduction of the catheter. He had strictures of many years' duration, which had caused several attacks of retention of urine, the first of which occurred ten years ago. These attacks were generally treated by full doses of opium, from which formerly he soon obtained relief; but latterly his sufferings, on such occasions, had been very great, from the long continuance of the retention. From the repeated unsuccessful attempts that had been made by several surgeons to get an instrument through the stricture, he strongly objected to my making any effort of the kind for his relief, and assured me that such practice had, on similar occasions, only added to the irritation of a highly irritable stricture. He was at length persuaded to permit me to in-

roduce a No. 2 plaster bougie, which was stopped by a stricture $4\frac{1}{2}$ inches; but after a little pressure, the instrument passed on to a second obstruction at six inches. I succeeded in getting the point of the bougie into the second stricture, where it was kept until the expulsive efforts of the bladder became very urgent, and then, on its having been withdrawn, nearly half a pint of urine came away, at first by drops, but afterwards in a small stream. The patient had taken a full dose of liq. opii sedativ. an hour before my visit, and the same quantity was ordered to be repeated in a short time.

At half past 8, P.M., no urine having been passed since my visit, I again introduced the small bougie with the same result as before.

I was called up at 5, A.M., January 13, and repeated the operation with a similar result. An ounce of castor-oil, which had been taken at bed-time, not having operated, the dose was repeated. As this gentleman had never found any benefit from the application of leeches to the perineum on similar occasions, they were not used on the present.

Jan. 13th, 11, A.M.—No urine having been passed since the introduction of the bougie early in the morning, I repeated the operation, using this time one of catgut, and allowed it to remain for ten minutes, when, on its being withdrawn, about half a pint of water came away, in rather a better stream than previously.

7, P.M.—The patient was quite comfortable, having been able to pass his water during the afternoon without assistance.

Jan. 14.—The potassa fusa was applied to the first stricture, causing a slight sensation of scalding when the urine was first passed afterwards, as well as the discharge of three or four drops of blood.

15th.—The potassa fusa was again applied with a No. 6 bougie, which entered a quarter of an inch into the stricture. When the bougie was withdrawn, its point was covered with a little bloody mucus, and a slight burning pain was felt for a few minutes. No irritation having ensued, the application of the potassa fusa was repeated on the 16th, 17th, and 18th; on which day the armed bougie passed through the first stricture to the second, where it was retained. No bloody discharge had followed the three last applications of the caustic.

19th.—The armed bougie was applied to the second stricture, which it entered about the eighth of an inch. In the evening I found that the result of the morning's operation had been a severe spasmodic pain in the perineum, which lasted about ten minutes, until the discharge of a few drops of blood afforded complete relief. Mr. W. had suffered much formerly, at various times, from this kind of pain. An opiate draught was directed to be taken at bed-time. All irritation having subsided the potassa fusa was again applied, at 11, A.M., on the 22nd, and the bougie went a little farther into the stricture. 7, P.M.—The urine had been only once passed, and that with scarcely any pain, since the application in the morning.

29th.—The potassa fusa has been applied every day, no irritation of any consequence having ensued. On two occasions three or four spots of bloody mucous discharge appeared upon the linen. The bougie has perceptibly advanced after each application, and the stream of urine is a little improved. The irritability of the bladder has nearly subsided, the urine now requiring to be voided but once during the night.

Feb. 13th.—The armed bougie has been used every day except on the 2nd, when it was omitted in conse-

quence of a slight return of the spasmodic pain. The stream of water has much improved during the last two days, and, with the exception of yesterday, there has been no coloured discharge since the 29th of January. After the use of the potassa fusa to-day, with a No. 6 bougie, a No. 4 was passed into the bladder, the last stricture having required twenty-seven applications before the bougie could be passed through it. The urethra, at the last stricture, for two inches, appeared to be of a cartilaginous hardness, and the daily use of the armed bougie caused but little irritation.

15th.—After having passed a No. 4 bougie into the bladder, I applied the potassa fusa with a No. 5, gently moving it backwards and forwards over the whole strictured surface. The potassa fusa was used daily until the 2nd of March, by which time the stricture had become sufficiently dilated to admit of the introduction of a No. 8 bougie into the bladder. The water was passed in a very good stream, and with scarcely any hesitation, or indeed difficulty of any kind. My patient was now obliged to return into the country, much to my regret, as the stricture still felt very hard, and there was much left to be accomplished. He intended to continue the treatment himself, but promised me to apply at once to the surgeon who had previously attended him, should any difficulty arise. This he did, and I received, on the 29th of April, a very satisfactory letter from that gentleman, informing me of the great advantage his patient had derived from the use of the potassa fusa. It will be seen that, in this case I used the armed bougie every day with but few exceptions. Although, from the hard and insensible nature of the stricture, no irritation worth mentioning resulted, if my patient's time had not been of great consequence to

him, I should not have applied the potassa fusa oftener than every second or third day. This case, therefore, must not be considered as a precedent for a similar practice. This gentleman's brother died of neglected stricture of the urethra. It has so frequently happened to me to have had brothers under my care with this affection, that I have thought the disease must be hereditary in some slight degree.

CASE XXXV.—*Irritable Stricture.*

Mr. G., about 40 years of age, first applied to me late in the evening of March 14th, 1849, having suffered acutely, for several hours, from retention of urine. This was not his first attack of retention; and he had long experienced more or less difficulty in passing his urine. He thinks his disease has been of more than twelve years' duration. I succeeded in introducing into the bladder a No. 2 gum catheter, which was stopped by a stricture at $6\frac{1}{2}$ inches.

15th, 8, P.M.—Has passed some urine with difficulty during the night and in the early part of the morning, but has been unable to void any for several hours. With a No. 3 gum catheter, which was firmly grasped by the stricture, I drew off about sixteen ounces of urine.

16th, 8, P.M.—Has had no retention, but his urine has been passed with considerable difficulty, by drops, and in a very small stream. A No. 3 plaster bougie was passed, and allowed to remain for a few minutes; when withdrawn it was followed by a few drops of blood. In an attack of retention, a few days before his application to me, this gentleman had applied to a surgeon, who had passed, with much difficulty, a small silver catheter, which caused great pain and considerable hæmorrhage.

18th.—The urine has been passed during the last twenty-four hours with difficulty, and there was so much spasm this evening that the No. 3 bougie could not be passed; I therefore applied the potassa fusa.

22nd.—Passed a No. 3 silver catheter.

25th.—Not being able to introduce the No. 3 catheter, I again used the potassa fusa.

28th.—The stream of urine has considerably improved. The potassa fusa was applied, the armed bougie having been passed backwards and forwards along the strictured portion of the urethra, which appeared to be of considerable extent.

Finding, on the introduction of No. 5 gum catheter, that it was firmly grasped, I applied the potassa fusa as before. The last application of the caustic appeared so entirely to remove the irritability of the stricture, that there was no farther indication for its employment; and, on the 7th of May, I was enabled to pass, with facility, a No. 12 sound. I have since passed a No. 13, which is of the natural size of the urethra. In this case I believe that the stricture has been completely removed by the potassa fusa.

CASE XXXVI.—*Impassable Stricture.*

H. B., Esq., about 36 years of age, first applied to me October 8, 1849. He had long suffered from stricture. Two years before his application to me a very small silver catheter had been passed. The operation caused a little bleeding and severe pain, followed by considerable constitutional disturbance. This gentleman had been under the care of an eminent hospital surgeon, who made several subsequent attempts to pass an instrument through the stricture, but failed in all.

The irritation of the bladder, in this case, was so great as to cause an almost irresistible desire of micturition nearly every hour, day and night. The urine was voided either by drops or in a very minute stream, with much straining. On examination, I found a stricture at $6\frac{1}{4}$ inches, impassable to the smallest bougie, and which bled on being gently pressed by the instrument. I applied the potassa fusa, and repeated its application every second day. On the seventh application, made October 20th, the bougie, a No. 6, passed through the obstruction, which was more than half an inch in length, and felt hard and gristly. On my next visit (Oct. 22), an unarmed bougie of the same size was passed through the obstruction, but did not go on into the bladder. As the instrument was firmly grasped, I again used the potassa fusa. On my next attempt to pass a bougie, on the 24th, there was so much spasm, that the same sized instrument did not go through the stricture. I therefore applied the caustic, and repeated its application on the 26th and 29th. On the 31st, I introduced without difficulty a No. 6 silver catheter into the bladder. I had no occasion to use the caustic again, as the stricture readily yielded to the introduction of the sound; and, on the 3rd of February, 1850, a No. 14, the full size of the urethra, could be passed with facility. The stricture, which, before the use of the potassa fusa, always bled more or less on pressure by the bougie, ceased to do so after the fourth application of the caustic, which also appeared to relieve, in a remarkable degree, the irritability of the bladder. This gentleman, who had occasionally suffered much from rigors, had only one attack during the treatment by potassa fusa. That attack occurred a few hours after the first introduction of an instrument into the bladder.

I saw this patient a few days ago, when the No. 14 sound was passed with facility.

CASE XXXVII.—*Irritable Strictures.*

E. P., Esq., 33 years of age, consulted me on the 4th of February, 1850. This gentleman had been annoyed with very troublesome symptoms of stricture for the last eight years, and had been for a long time under the care of an excellent surgeon, well conversant with the treatment of this disease, but who did not use caustic. This surgeon had occasionally succeeded in passing a small bougie into the bladder, but never could get beyond a No. 5. It usually happened that for some time after the introduction of a bougie, the stricture remained so extremely irritable as to be impassable to the smallest-sized instrument. The perineum had been freely leeches at various times ; opiates by the mouth, also as suppositories, and in the form of enemata had been used with but little benefit. The gentleman's health had suffered considerably, and, deriving no advantage from the means employed for his relief, despairing of improvement, he had given up all treatment fifteen months before his application to me, which was in consequence of an attack of retention of urine, from which he occasionally suffered. His urine had been passed for several months, either in a very small stream, or by drops. On examination, I found a stricture at four inches, impermeable by the smallest bougie, and which bled on very slight pressure. After three applications of potassa fusa, at intervals of three days, the bougie, a No. 5, passed through the stricture, and stopped at a second obstruction at $5\frac{1}{2}$ inches. This second stricture was hard and gristly, having required

seven applications of the caustic before a bougie could be passed through it. Three days afterwards, I introduced with facility a No. 6 silver catheter into the bladder. No further application of potassa fusa was requisite, as the strictures readily yielded to the introduction of plated steel sounds; and, on the 24th of June, I passed a No. 12, the full size of the urethra, without being able to detect any hardness. This gentleman's principal urinary distress was evidently caused by the stricture nearest the external orifice of the urethra, as, after that had been subdued by the potassa fusa, he suffered no pain, and passed his urine in a better stream than for many months previously. I saw this patient a few weeks ago, and passed for him the No. 12. There does not appear to be the slightest disposition in this case to a return of the strictures; but, as a precaution, I have advised him to test his cure by an occasional introduction of the sound.

CASE XXXVIII.—*Irritable Strictures.*

Captain F., aged 37, an officer of dragoons, who had been several years in India, first consulted me April 16th, 1850. He had been a very great sufferer from stricture for the last twelve years, during which time he had been treated by different surgeons by the introduction of bougies and sounds. The passing of instruments, however, always caused so much irritation, that he derived but little benefit from their use. The gentleman who last attended him had succeeded occasionally in the introduction of a small steel sound, but the operation was always excessively painful, and followed by considerable hæmorrhage. No instrument had been passed for the last three years. The urine has long been

voided with much difficulty, and latterly with very great straining; it usually passes by drops; and the attempts to empty his bladder frequently continue for nearly half an hour at a time. For many years he has seldom been free from gleet discharge, and micturition is attended with a severe scalding pain, affecting chiefly the first inch and a half from the external orifice of the urethra. Has had several attacks of gonorrhœa. The perineum has been freely leeches at times, but without affording him relief. I examined the urethra with a No. 3 plaster bougie, which stopped at two inches; a little pressure, however, caused it to advance another inch, when it was again arrested, but soon passed on to $5\frac{1}{2}$ inches, where it was finally arrested by another obstruction. I applied the potassa fusa to the first stricture at two inches.

April 17th.—Applied the potassa fusa to the second stricture.

18th.—The gleet discharge has rather increased, and is coloured with blood. A No. 5 bougie was passed to the third obstruction at $5\frac{1}{2}$ inches, to which I applied the potassa fusa.

19th.—Had a rigor this morning. The patient had formerly suffered greatly from rigors. The urine is passed with but little straining. A warm bath and an opiate was ordered.

20th.—Less irritation; and the urine was voided in my presence in a continued stream. I passed a No. 4 plaster bougie into the bladder, but it was firmly grasped by the last stricture.

21st.—The urine is passed more freely and with less scalding. Captain F. said, he never experienced from any other treatment so much relief in so short a time.

Applied the potassa fusa on a No. 6 bougie to the third stricture, which it entered.

22nd.—As there was rather more irritation than usual, the urethra was left undisturbed.

23rd.—The urine is passed better than it has been for several years. A No. 6 bougie passed through all the strictures; I applied the caustic on a No. 8 bougie, and repeated its application on the 27th. This gentleman was obliged to leave town unexpectedly the next day. He wrote to me from his residence in the country, not knowing how to proceed. I urged him to persevere in the use of the bougie. Being anxious to learn how he was getting on, I wrote to him in the early part of last August. In his reply he observes, "I can now pass a No. 9; the first stricture is gone, the others are better, as you may suppose, but not by any means well; still they are progressing." He added, that "he had been under the care of a great many professional men, but never received anything like the relief which he had done from the potassa-fusa treatment." This gentleman stated, on his first application to me, that it would be impossible for him to remain in town more than a fortnight, or I should not have applied the caustic at such short intervals. The applications, however, were very gentle ones, and did not cause much irritation.

CASE XXXIX.—*Irritable Stricture.*

Mr. C., about 36 years of age, applied to me, May 12th, 1850. Has had symptoms of stricture for the last twelve years. The difficulty of micturition has lately very much increased, and he now passes his urine with great straining in a very fine stream, or by

drops. Attributes his complaint to a protracted gonorrhœa. Examination disclosed a stricture at $5\frac{1}{2}$ inches, through which I succeeded in passing a No. 1 bougie.

15th.—Has voided his urine with rather less straining. I could not pass the No. 1 bougie; and, having been equally unsuccessful on the 19th, I on that day applied the potassa fusa, which caused no pain, but only a slight sensation of heat.

22nd.—The urine has been passed better since the application of the caustic, and the irritability of the bladder, which previously caused him much annoyance, is greatly diminished. I first passed a No. 2 bougie easily into the bladder; and shortly afterwards a No. 5 as readily. I applied the caustic but once more, which was on the 26th, the stricture having become easily dilatable. On the 16th of June I could pass a No. 12 sound, the full size of the urethra, and there was then no sign of stricture. I have no doubt that the two applications of the caustic alkali entirely removed the stricture, which, although but of slight extent, had been attended with great suffering. It may be satisfactory to state, that I passed the No. 12 sometime afterwards for this gentleman, when the urethra appeared to be quite healthy.

CASE XL.—*Hard Irritable Impermeable Strictures.*

E. S., Esq., 40 years of age, residing in the north of England, first consulted me, July 16, 1850. He had been many years a great sufferer from stricture. The origin of his complaint he attributed to a severe gonorrhœa contracted in 1834, which lasted for several months. In 1836 this gentleman contracted another gonorrhœa, which left a gleet discharge, from which

he has scarcely ever since been entirely free. His urine has not been voided in a full stream from the period of the first attack of gonorrhœa; and soon after the second occurrence of that disease micturition became so difficult as to render necessary an occasional introduction of a bougie. Mr. S. has ever since suffered more or less from stricture. Several attempts have been made by different practitioners to cure him by dilatation; but No. 7 is the largest sized instrument that any of them had been able to get into his bladder. In 1844 this gentleman had a very severe attack of retention of urine, and then placed himself under the care of an eminent surgeon, under whose treatment he continued for eighteen months. The strictures were then so extremely irritable that for a long time no instrument could be passed through them; and a No. 5 bougie was the largest size that had been introduced at the expiration of the year and a half, when he left his surgeon. Mr. S. was, for some time afterwards, able occasionally to pass for himself No. 5 bougie; but, for the last two years, his strictures have continued impervious to the smallest sized instrument. Has had occasional attacks of retention of urine for more than five years, and the last which occurred was unusually severe, but yielded at length to large doses of opium. The surgeon to whom the patient applied for relief for this last attack of retention having tried for six months ineffectually to get an instrument through the stricture, a consultation was held with the gentleman under whose care he had remained for eighteen months, when it was decided that his only chance of relief was the operation by perineal section. It was under these circumstances that I was consulted. At this time the gentleman's sufferings were extreme, his urine being passed only by

drops, and with very great straining, which lasted frequently half an hour at a time. He could not void his urine in the erect position, and was generally obliged to go to the water-closet for that purpose. Every attempt to micturate causes a partial erection of the penis, with severe scalding pain. On examination with a small bougie, a stricture was detected at $5\frac{1}{4}$ inches, to which I applied the potassa fusa.

17th.—There has been no irritation from yesterday's application. I saw him pass his urine, in a thread-like interrupted stream; but he tells me that the straining is less than before the application of the caustic. I applied the potassa fusa on a No. 6 bougie, which soon entered the stricture into which it passed the eighth of an inch.

18th.—Has had a better night than for some months past, the irritability of the bladder being much diminished. He had taken a dose of castor-oil, which acted freely at 10, A.M., at which time a considerable quantity of urine had been passed. On my visit, at 3, P.M., Mr. S. was endeavouring, but ineffectually, to void his urine, and the contractions of the bladder were very painful. I passed a No. 3 bougie through the stricture, but could not get it into the bladder, from its being too tightly grasped. The bougie was retained for about three minutes, and, when withdrawn, the urine followed in a very fine continuous stream. 8, P.M.—No urine had been passed since my visit at three o'clock, and the contractions of the bladder had again become urgent. I tried to pass a No. 4 bougie, but did not get it through the stricture; and, although the instrument was retained a short time, no urine followed on its being withdrawn. I then tried a No. 2, which passed with facility into the bladder. The bougie was retained for five minutes, and, when withdrawn, the urine followed in a continuous

stream, the size of a crow's quill. The patient has been kept well under the influence of opium.

19th, 9, A.M.—Has passed his urine without difficulty. Applied the potassa fusa on a No. 6 bougie, which passed through the stricture, but stopped at another obstruction an inch beyond the first. 20th.—Applied potassa fusa to the second stricture. 21st.—Has had no difficulty in micturition, having been disturbed but once during the night. Applied potassa fusa to the second stricture, and repeated its application on the 22nd. On the 23rd I passed a No. 4 bougie into the bladder, and afterwards used the caustic. 24th.—As there was no irritation, I again applied the armed bougie. 25th.—The urine passes very freely. Applied potassa fusa, and repeated its application on the 26th and 27th. The urethra was left undisturbed until the 30th, when I easily passed a No. 6 bougie into the bladder. As the second stricture still felt very hard, and as the patient could only remain in town for three weeks from the commencement of my treatment, I applied the caustic, and used it four more times. On the 8th of August, I easily passed a No. 8 bougie into the bladder. This gentleman left London the following day, when he voided his urine in a good stream, the irritability of the bladder having entirely subsided. The patient promised to let me hear from him if he had the slightest difficulty in completing the dilatation of his strictures. I heard from Mr. S., in December, 1851, when he informed me that latterly his strictures had become much predisposed to spasm. I advised him to have a few more applications of potassa fusa, as there still remained much thickened tissue at the seat of obstruction.

CASE XLI.—*Impassable Stricture.*

W. S. B., Esq., 32 years of age, residing in the country, first consulted me, September 7, 1850, and gave the following account of his complaint :—"Between seven and eight years ago I first suspected myself to be affected with stricture, and applied to a surgeon, who, after passing a small bougie, told me I had two strictures. At first I thought myself benefited by his treatment, and for a time cherished hopes of a cure, but these hopes soon gave way. Although a tolerably sized bougie could be passed, it seemed to have no permanent effect in enlarging the stream of urine ; often it was very tightly grasped, especially by the first stricture, and sometimes was with difficulty passed at all. At length I gave up attending the surgeon ; and having derived no advantage from the use of the bougie, my strictures have ever since been left undisturbed." This gentleman's urine is passed with difficulty in a small forked stream. On examination with a No. 5 bougie, it was stopped by a stricture at $5\frac{1}{4}$ inches, to which I applied the potassa fusa, and repeated its application on the 9th and 10th. Before applying the caustic on the 11th, I examined the urethra with an unarmed bougie of the same size as had been previously used, when it passed through the stricture, and stopped at another, $6\frac{1}{2}$ inches from the orifice. As no irritation of consequence had been caused by the previous operations, I applied the potassa fusa to the second obstruction, which required three more applications before it became permeable. On the 15th, I passed a No. 7 sound into the bladder, having the day before failed in getting it through the second obstruction. The urethra, from the

last stricture to the bladder, felt hard and rugged ; it seemed as if the instrument passed over a ridgy surface at the inferior portion of the canal. The sound was retained for half an hour. I had no further difficulty in dilating the strictures, being able to increase the size of the sounds daily ; and on the 21st, a No. 12, the full size of the urethra, was readily passed. The instruments were latterly retained for nearly an hour, and scarcely caused any irritation. A little mucous discharge, slightly tinged with blood, was caused by the first three applications of the caustic. This gentleman could only remain in town for a fortnight, or I should have preferred proceeding more slowly ; but there was fortunately no urethral irritation of importance during the whole treatment. The patient was desired to continue the use of the sound regularly for some length of time. The ridgy feeling behind the stricture had entirely disappeared, and the stream of urine was of a full size.

CASE XLII.—*Impermeable Stricture.*

J. L., aged 42, admitted a dispensary patient, May 8, 1850. Has suffered much from stricture for the last twelve years, accompanied with more or less gleet discharge. During the last five years his urine has been voided with great straining, principally by drops, micturition usually occupying from a quarter to half an hour at a time. Has latterly been much annoyed by the urine dribbling away, especially when standing or sitting. Is seldom free for more than half an hour, day or night, from urgent calls to void his urine. This man had been for the last twelve months under the care of an excellent surgeon, who treated him chiefly

by the steel sound. Upon only one occasion could any instrument be got through the obstructions, and that was about six months ago, when a very small steel sound appeared to enter the bladder. The operation caused severe pain, and rather free bleeding, followed by so much urethral irritation, that his sufferings were increased; and ever since all attempts to pass an instrument through the first stricture have been unsuccessful. On examination, I found an impermeable stricture at $3\frac{1}{2}$ inches, to which I applied the potassa fusa, and repeated the application four times before a No. 5 bougie could be passed through the obstruction. There was another stricture at five inches, which required five applications of the caustic before the same sized bougie could be passed through it. On the 28th of June I was enabled to pass a No. 8 bougie into the bladder, and on the 6th of July a full-sized steel sound. There was no irritation of consequence from the application of the caustic potash. The man has since occasionally attended at the dispensary, when a No. 12 sound has been readily introduced.

CASE XLIII.—*Impassable Stricture.*

C. B., aged 41, admitted a dispensary patient, July 8th, 1851. Has suffered several years from stricture. Four years ago was two months in a hospital, when his surgeon, on one occasion, passed a No. 2 bougie into his bladder, but every subsequent attempt to introduce the bougie proved unsuccessful. No instrument of any kind has since been got through the stricture. His urine has long been voided with a very painful straining, chiefly by drops, and he is much disturbed, night and day, with an almost irresistible desire to mictu-

rate. The attempts to pass instruments have mostly been followed by severe rigors. I found an impermeable stricture at $5\frac{1}{4}$ inches, and applied potassa fusa; repeating its application on the 10th and 15th. On the 17th, the urine was passed with less straining, and sometimes, in a fine stream. Tried to pass a No. 2 bougie, but, being unsuccessful, applied potassa fusa. 19th.—The patient did not rise once last night to void his urine, which he says now passes better than it has done for several years past. Introduced a No. 3 bougie into the bladder; has had no irritation from the applications beyond a slight gleet discharge, nor has he had any recurrence of the rigors from which he formerly suffered so severely. 24th.—I saw the patient void his urine in a middle-sized stream. As there still existed considerable thickening at the seat of obstruction, I applied the potassa fusa, repeating its application on the 26th, 29th, 31st, and 2nd of August. I did not again use the caustic, as the stricture became easily dilatable, so as, very soon, to admit the introduction of a No. 12 sound, the full size of the urethra.

CASE XLIV.—*Impermeable Stricture of long standing.*

T. R., aged 64, admitted a dispensary patient, August 30th, 1851. Has been affected with stricture the greater part of his life, and has had several attacks of retention of urine. No instrument has been passed into his bladder for the last ten years. Is troubled with an almost constant dribbling of urine, which for a long time has been passed only by drops, with great straining. On examination, a stricture was detected at $6\frac{1}{4}$ inches, impermeable to the smallest instrument. Applied potassa fusa, and repeated its application, Sep-

tember 3rd, 6th, and 9th. On the 13th, the patient said that he had passed his urine in the morning in a small stream, it being the first time he had done so for many years. Did not apply the caustic, but introduced a No. 5 sound, which entered, for about $\frac{1}{4}$ of an inch, a hard, gristly stricture. 16th.—Applied potassa fusa, and repeated its application on the 18th. Finding on the 22nd, that the stream of urine had much improved, I tried a No. 6 sound, which, after a little gentle pressure, passed into the bladder. As the greater part of the bulbous and membranous portions of the urethra appeared to have been converted into a hard, irregular, gristly mass, I had recourse to six more applications of potassa fusa; and on the 15th of October I was able to pass into the bladder a No. 8 sound, which size has not been increased, as he has naturally a very small urethra. In this case the stricture was highly sensitive; and, from the obstruction which the sound constantly meets with at the entrance to the bladder, there must be some little thickening at that part. I can detect no enlargement of the prostate, and the patient has the power of completely emptying his bladder. As the man attends regularly at the dispensary, and passes his urine remarkably well, I have not thought it necessary to continue the use of potassa fusa, although there still remains much thickening at the seat of obstruction, which would, doubtless, re-contract if it were not for the occasional introduction of a sound.

CASE XLV.—*Irritable Strictures.*

C. C., Esq., aged 41, residing in the country, had for many years been a great sufferer from highly irritable strictures. He was very desponding, having been under

the care of several able surgeons, who had tried, in his case, the ordinary means of relief, including those by retention of the catheter, and the application of nitrate of silver. He did not think the nitrate of silver produced any good effects. Perineal section was at last proposed as his only remaining chance of relief. Before submitting to that operation, however, the gentleman was advised by his ordinary medical attendant to consult me, which he did on the 25th of July, 1851. At this time micturition was accomplished with much difficulty, and the irritability of bladder was very great, it having been necessary for a long time past to exhibit opiates at bed-time to procure a tolerable night's rest. So great has latterly been the difficulty of micturition that it could seldom be effected unless the point of a No. 3 gum catheter, without its stilet, was previously introduced. On examination with the gum catheter, for the patient having suffered so much pain from the introduction of instruments, would not permit me to use any other, an obstruction was met with at $4\frac{1}{4}$ inches, which was highly sensitive. As the urine was too acid, a draught containing ten drops of liquor potassæ, with the same quantity of tincture of hyoscyamus, in an ounce of camphor mixture, was ordered to be taken three times daily. On the 27th I applied the potassa fusa on a No. 3 bougie, which soon passed on to another obstruction at $5\frac{1}{4}$ inches. Both strictures were so sensitive, and the patient so extremely nervous, that the bougie was not retained in the urethra long enough for an efficient action of the potash. 29th.—Applied potassa fusa on a No. 3 bougie, not using a larger size, as I wished to avoid any distension of the strictures, which had always produced considerable irritation. This application, which was much more

efficient than the first, caused merely a sense of heat. 31st.—Has had two good nights' rest, and less difficulty in micturition. August 2nd.—The irritability of the bladder has greatly subsided; applied potassa fusa to both strictures. 4th.—So much improved that the patient fancied himself "completely cured." Did not use the caustic, but passed a No. 5 bougie into the bladder. 6th.—Has not passed his urine so well since the introduction of the bougie. Has had no urethral irritation beyond a few yellowish spots upon the linen since the first application of the caustic. Applied potassa fusa to the second obstruction, the first having been apparently removed. Repeated the application of the potash on the 9th, 12th, 15th, and 18th, when Mr. C. was obliged to return to the country for a short time. September 2nd.—Has had no difficulty of micturition during his absence; applied potassa fusa. 7th.—Passed a No. 6 bougie into the bladder, when a third obstruction, less sensitive than the others, but more rigid, was discovered at $6\frac{1}{2}$ inches. 9th.—Applied potassa fusa to the last stricture. The patient was conscious of the existence of the last obstruction, which, he told me, was always more irritated when stretched by the bougie, than were the other strictures. Mr. C. was obliged to leave town for a few days, and did not return until the 23rd, having passed his urine during his absence "better than for the last ten years." Applied potassa fusa to the second and third obstructions, and repeated its application on the 25th and 27th, when the patient again went into the country. On the 8th of October he returned much improved. Applied potassa fusa on the 12th 14th, and 16th, when my patient finally left me for the country, at that time passing his urine as well as he recollected ever to have done. These highly irritable strictures were,

throughout my attendance, treated with the greatest gentleness. During the whole time Mr. C. was under my care he was actively employed, never having been confined to his room for a single day. There is, however, some thickening at the last stricture, and the patient, will probably, for some length of time, be subject to occasional attacks of irritation at that part, which may require a gentle application of potassa fusa for their relief.

CASE XLVI.—*Hard Irritable Stricture.*

C. —, Esq., aged 41, residing about twenty miles from London, first consulted me on the 8th of September, 1851, having for the last fifteen years suffered greatly from stricture, which had caused frequent attacks of retention of urine ; indeed, for some months past micturition has seldom been effected without the previous introduction of a small bougie into the obstruction. The urine has for a great length of time been passed with considerable difficulty. The stricture is highly predisposed to spasm, a small bougie, No. 3, which can only occasionally be passed into the bladder, being very firmly grasped. Has been treated by dilatation in good hands ; but none of his surgeons have been able to make further progress in his case than the introduction of a No. 5 bougie, which generally caused so much irritability of the stricture, that for some weeks afterwards, even the smallest instrument could not be passed. The irritability of bladder was considerable, the patient being harassed more or less constantly during the day, and his night's rest much disturbed by urgent inclination to pass his urine. The penis is considerably enlarged ; and for the last two years the erections, which seldom

occur, have been weak, whilst involuntary seminal emissions occasionally take place. On examining the urethra with a No. 3 bougie, I found, at seven inches from the meatus, a gristly sensitive stricture, about $\frac{3}{4}$ of an inch long, through which, after considerable pressure, the instrument passed on into the bladder. So great was the pain, and so urgent the desire of micturition, that I was very soon obliged to withdraw the bougie, which was strongly grasped, being stained with bloody mucus. As the gentleman was obliged to return to the country immediately, I did not then apply the caustic, but prescribed some medicines to allay urethral irritation. As it was evident this was not a case to yield to dilatation, on the 27th I applied the potassa fusa, using a No. 3 bougie, which was passed backwards and forwards along the obstruction. Oct. 3.—A slight muco-purulent discharge succeeded the last application of the caustic. Applied potassa fusa, which caused merely a slight sense of heat. Repeated the application of potassa fusa, Oct. 7th, 15th, and 20th. On my patient's next visit, Oct. 27th, he assured me that since the last operation he had passed his urine better than for many years previously. Applied the caustic on a larger bougie, a No. 6, which passed backwards and forwards through the stricture, with but little grasping. As the stricture was still hard, I repeated the application of potash on the 3rd, 10th, and 17th of November. On the 2nd of December, the stream of urine had become of a good size, the stricture admitting easily the introduction of a No. 8 bougie, with which the caustic was applied. Has had no irritation during any of the above applications, beyond an increase of his usual gleety discharge, which has occasionally been of a brownish colour. This gentleman has since come to

me at uncertain intervals, varying from one to three or four weeks, having passed his urine remarkably well ; and I can now introduce with facility a No. 11 bougie, with which size, or a No. 10, the application of potassa fusa has been continued, as the diseased tissue is not yet sufficiently removed to trust entirely to dilatation. The hypertrophy of the penis has nearly subsided, and the erections have improved in strength and frequency. The nocturnal seminal emissions seldom now occur.

CASE XLVII.—*Irritable Strictures, attended with Spermatorrhœa.*

Sept. 12, 1851, I was consulted by Mr. B., about 50 years of age, formerly an officer in the army. This gentleman for the last twenty-two years had suffered considerably from strictures, which he attributed to a protracted gonorrhœa, attended with chordee. His strictures, three in number, one at five, another at six, and the last at $7\frac{1}{2}$ inches, have, in general, been very irritable, having caused several attacks of retention of urine and catarrh of the bladder. Although he had been able occasionally to pass a No. 10 elastic gum bougie, its introduction always caused considerable urethral irritation, frequently attended with profuse gleety discharge. Latterly he has also been much harassed by spermatorrhœa, the seminal emissions occurring commonly as often as twice in the night. Under these circumstances, about twelve months ago, his surgeon was induced to apply the potassa fusa three times to all his strictures, and the applications he said afforded him wonderful relief, the caustic having, as it appears completely removed the two first strictures, and nearly

all urethral irritation; the seminal emissions now seldom occurring, and never oftener than once a month, I was consulted upon the propriety of any farther application of the caustic potash, for which there did not appear to me to be the slightest necessity, as I was enabled, with facility, to pass a No. 11 silver sound into the bladder, there being merely a slight obstruction at $7\frac{1}{2}$ inches, which easily yielded to the instrument. I advised the patient to permit his surgeon to increase the size of the sound gradually to the full size of the urethral orifice, which appeared to be about that of a No. 14. I have related this case as a good illustration of the quick relief afforded by the application of potassa fusa to the urethral irritation and its dependent spermatorrhœa.

CASE XLVIII.—*Irritable Strictures.*

Mr. L., aged 38, first consulted me, Nov. 25, 1851. Had gonorrhœa ten years ago, and from that time has never been entirely free from gleet discharge. Six months after the occurrence of the gonorrhœa, he received a sharp blow upon the perineum. For the last seven years the urine has been passed with more or less difficulty. Has been under the care of several surgeons. It was six months before the gentleman to whom he first applied could succeed in getting a No. 1 bougie into his bladder. After continued perseverance, and by placing the patient in a vapour-bath, previous to the introduction of the bougie, a No. 5 was eventually passed. That size, however, caused great irritation, and the patient, getting no better, afterwards went to other surgeons, having had the nitrate of silver applied by one of them; but none of them could succeed in pass-

ing for him a larger size than No. 5. Mr. L. is very desponding, having for some length of time despaired of obtaining farther benefit from surgical treatment. In addition to the gleet discharge previously mentioned, his bladder is very irritable, his night's rest being much broken by urgent desire to micturate, which he is never certain of effecting without the previous introduction into the stricture of an elastic gum bougie, which he always carries in his pocket. I found, on examination, an obstruction at $2\frac{1}{2}$ inches an inch long, and another, about the same length, at $5\frac{1}{4}$ inches, through which I had some difficulty in passing a No. 5 bougie, its introduction being very painful from the extreme irritability of the strictures. As this was evidently a case not to be farther benefited by dilatation, I at once applied potassa fusa to the first stricture. November 27th.—Applied potassa fusa to both strictures. As the urine was too acid, some alkaline drops, with tincture of hyoscyamus, were prescribed. 29th.—Has passed his urine better. His usual yellow gleet discharge has been of a brownish colour. Applied potassa fusa to both strictures on a No. 6 bougie; after six more applications of the caustic to both strictures, a No. 10 bougie entered the bladder with facility. The patient voids his urine in a good stream, and all irritability of bladder has subsided. There appeared to be no farther necessity for applying the caustic, the strictures being soft and yielding. I advised the regular introduction of bougies, gradually increasing their size until one as large as the meatus could be passed. I heard from the patient a short time ago, who informed me that he passes his urine in a free stream, and has had no difficulty in continuing the dilatation of his strictures.

CASE XLIX.—*Hard Irritable Strictures.*

Mr. R. C., aged 45, first consulted me, December 30th, 1851. Has been troubled for several years with more or less difficulty in micturition, which has latterly much increased. Fourteen months ago his surgeon succeeded in getting a No. 2 silver catheter into his bladder, but was never afterwards able to succeed in its introduction. He has at present a gleety discharge, with frequent micturition, disturbing him much during the night, and is a long time emptying his bladder. The stream of urine is small and interrupted. On examination, I found a stricture at $5\frac{1}{2}$ inches, and at length succeeded in passing a No. 2 plaster bougie into the bladder, which, on being withdrawn, was very firmly grasped and indented. On the patient's next visit, January 1st, 1852, finding again some difficulty in passing the No. 2 bougie, and considering that the treatment of the case by dilatation would, at all events, be very tedious, even if otherwise satisfactory, I applied the potassa fusa. January 3rd.—Has passed his urine rather better; applied potassa fusa. January 5th.—No irritation; applied potassa fusa on a No. 4 bougie, which soon passed through the stricture, but was stopped by another obstruction at $6\frac{1}{2}$ inches, to which I also applied the caustic. January 7th.—The stream of urine has improved, and the irritability of the bladder is diminished. Examined the urethra with a No. 4 bougie, which readily passed through the first stricture, and entered the second nearly a quarter of an inch; applied potassa fusa to the latter obstruction. January 9th.—Improving; applied potassa fusa to the last stricture. The patient was obliged to leave town for a fortnight, when the stream of

urine appeared of a good size, and I had little difficulty in the introduction of a No. 6 silver sound. There was no farther occasion for the application of potassa fusa, as the strictures gradually yielded to the introduction of a full-sized sound, which the patient occasionally passes for himself. The last time I saw him, he passed his urine in a full, free stream. No irritation, beyond a gleety discharge, occasionally of a brownish colour, occurred during the treatment.

CASE L.—*Old Hard Irritable Stricture.*

R. B. T., Esq., aged 41, residing a few miles from London, applied to me, March 8th, 1852, having for many years suffered considerably from stricture, which he attributes to a gonorrhœa contracted twenty years ago. Had been under the care of different surgeons, but a No. 5 bougie is the largest sized instrument that had been passed into his bladder, every attempt at farther dilatation having produced so much irritation as to increase the contraction for a time. Had latterly been unable to pass the smallest bougie; and on his application to me, his urine was voided with great straining, principally by drops. The irritability of the bladder was very distressing, the patient being seldom free for a single hour from an urgent inclination to pass his urine, except when under the influence of an opiate taken at bed-time. Has long been subject to more or less gleety discharge, and his penis is considerably enlarged. As this gentleman was actively employed during the day, and had to come to me from a distance of some few miles, I thought it desirable to try dilatation before having recourse to potassa fusa, although he himself had but little confidence in the former mode of treat-

ment. I succeeded in getting a No. 2 plaster bougie into the bladder through a long hard stricture at seven inches from the meatus. As the urine was too acid, the patient was ordered to take ten drops of solution of potass and the same quantity of tincture of hyoscyamus, three times daily. Having been unable to increase the size of the bougie beyond No. 3, the stricture continuing very unyielding, and its length and irritability being too great to permit the introduction of a solid dilating instrument, on the 22nd of March, I applied the potassa fusa. The application of the caustic was repeated every third day with the effect of a gradual improvement in micturition. May 8th.—I passed a No. 6 sound into the bladder, having previously been unable to introduce a metallic instrument. May 15th.—Passed a No. 7 sound which was introduced occasionally until June 21st, when the patient voided his urine remarkably well, so much so that he discontinued his attendance; but I hope he has gone on with the dilatation of his stricture, which otherwise will be sure to re-contract as there remained much thickening at the seat of contraction on his last visit to me.

CHAPTER VIII.

ON THE OPERATIONS FOR THE RELIEF OF RETENTION OF URINE, AND FOR THE DIVISION OF STRICTURES.

PUNCTURE OF THE BLADDER.

THE operations occasionally performed for retention of urine, and for division of strictures, are none of them entirely free from danger. Each has its peculiar hazards. In some cases of intractable strictures the performance of one of them may, however, offer the best, if not the only, chance of affording relief. It becomes then a subject of deep interest to the surgeon to ponder well what are the circumstances in which these operations may be required; and when necessary which of them should be selected as most advantageous to the patient.

Continued retention of urine may place life in such peril, that one of these operations may be the *only* chance for its preservation. Under long suffering from a stricture impervious to instruments, the general health may gradually fail, and the bladder become so irritable as to render exceedingly hazardous any farther delay in procuring a free passage for the urine. These are not, however, the only circumstances in which an operation may be required. It may so happen that a stricture has

long been impassable to instruments, and although there may be no retention of urine, whilst the powers of the constitution remain but little impaired, yet an operation will be equally necessary as in the instances previously mentioned. It is true that such necessity may not be so apparent to the patient, but to the surgeon, with whom "coming events cast their shadows before," the necessity is quite as palpable. The latter foresees the mischief, which sooner or later must occur behind the obstruction. He knows that at any time an ulcerative breach may be made in the urethra; or, that the canal may be forcibly burst by the powerful action of an hypertrophied bladder, when all the resources of surgical art may probably prove powerless in rescuing the sufferer from destruction.

If, after the failure of other and less severe means of overcoming the obstruction, continued retention of urine, a breaking up of the general health, or impending extravasation of urine should render an operation necessary, it will then be the duty of the surgeon to adopt that which, under the peculiar circumstances, will be attended with least hazard and likely to afford the most permanent benefit to his patient.

PUNCTURE OF THE BLADDER.—This was formerly the operation commonly performed for the relief of a patient suffering from retention of urine, and is at present that which appears to be most generally practised. There are three ways by which the bladder may be punctured:—By the perineum. Through the rectum. Above the pubes. The first method has but few advocates, being severe and also more hazardous than the others, from its greater liability to be followed by cellular infiltration of urine.

PUNCTURE THROUGH THE RECTUM.—This is an opera-

tion very easily performed, and in retention from stricture, unattended with enlargement of the prostate, is probably the method that will be found most advisable in the majority of cases. In the hands of Sir Everard Home, who performed it on several occasions, this operation proved remarkably successful. The mode of proceeding is very simple. As good a position as any for the operation is obtained by having the patient's nates brought forward, so as to project a little over the edge of the bed, with his thighs supported by assistants in a similar position to that for lithotomy. The rectum having been well emptied by an enema, a short time before commencing the operation, the surgeon, introducing his left index finger, well oiled, into the rectum, passes its tip just beyond the posterior boundary of the prostate gland, and keeps it there fixed as a guide for the passage of the proper curved canulated trocar, which is then passed along the finger, and the point of the instrument so directed, through the coats of the rectum and bladder, that the vesical puncture is made in the lower part of the triangular space to avoid the chance of any escape of urine into the peritoneal cavity. The trocar having been withdrawn, the canula should be securely fixed in the bladder by a T bandage, and retained until the stricture has yielded to the introduction of an instrument sufficiently to permit the passage of the urine by its natural channel.

The necessity for keeping the canula in the bladder is evident, for it has frequently happened that when the tube has either accidentally escaped, or been intentionally withdrawn, the surgeon has been compelled to resort to re-puncture, in consequence of a return of the retention.

This operation has proved fatal from urinary infiltra-

tion causing gangrenous inflammation of the cellular tissue between the bladder and rectum; also, from the escape of urine into the peritoneal cavity, of which, however, there is not much probability when the operation has been properly performed. The wound made in the operation has occasionally remained fistulous during life. An abscess has sometimes formed between the bladder and rectum, after the recto-vesical puncture, and the vesiculæ seminales have been wounded, in some instances, proving that, however simple the operation may be considered, it is one neither lightly nor carelessly to be performed.

Mr. Cock, of Guy's Hospital, who has probably performed this operation oftener than any other surgeon in London, considers that in cases of retention of urine the bladder may be reached with the least risk of present or future danger, and with the greatest prospect of ulterior good, by puncture through the rectum. Mr. Cock has performed this operation occasionally in cases of impermeable strictures, in which, although attended with great difficulty in micturition, there was no immediate necessity for its performance for the relief of retention. Mr. Cock believes the operation in such cases to be justifiable, from the advantage subsequently gained by the stricture yielding to dilatation. In the "Lancet" of January 31, 1852, Mr. Cock has related three cases of puncture by the rectum, in which, after the urine had passed for a few days through that channel, the urethra remaining completely at rest, the strictures then yielded to dilatation. Although fully agreeing with Mr. Cock that this operation, when admissible, is preferable, in cases of retention of urine, to those of perineal section, forced catheterism, or even opening the urethra, except under peculiarly favourable circumstances, I

should never perform it, or recommend its performance, except in urgent cases of immediate danger, being confident that the potassa fusa, when properly used, will, with rare exceptions, enable the surgeon to accomplish dilatation under such circumstances without the slightest risk to the patient.

Mr. Cock has had constructed by Mr. Biggs, of St. Thomas's Street, a double canula, with cranks so fixed to the upper part of the outer one, that the instrument cannot slip out of the bladder and rectum.

Sir B. Brodie, in his remarks on the different operations required for retention of urine resulting from stricture, observes :—"On the whole, from what experience I have had on the subject, I am inclined to believe that the puncture of the bladder from the rectum is applicable to a greater number of cases than any other operation." It would be injustice to my readers were I to omit the concluding observations upon this subject by the same eminent surgeon, which cannot be too extensively diffused; they are, indeed, highly significant, in these times, when there are so many aspirants eager for distinction in the alluring department of operative surgery; the observations alluded to are the following : "After all, however necessary it may be to the safety of the patient, in some instances, it is an operation that 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."

PUNCTURE ABOVE THE PUBES.—This was a favourite operation of the late Mr. Abernethy, who preferred it to the recto-vesical method. His mode of performing it

appears to me to be the best and the safest. Having made an incision through the integuments extending two inches upwards from the symphysis pubis, then separating the pyramidal muscles, and feeling with his finger the distended bladder, he easily made the perforation with the canulated trocar, directing its point towards the os coccygis. The trocar having been removed, an elastic gum catheter was then introduced through the canula, and the latter was withdrawn. The end of the catheter projecting from the wound was bent downwards towards the pubes, and fixed steadily by attaching it to a circular bandage placed round the patient's body. The tube left in the bladder must be plugged, and the plug removed when the bladder requires to be emptied.

Infiltration of urine, and a sloughy state of the wound have, occasionally, proved fatal after this operation. The best means of preventing infiltration will be a free external incision, and the maintenance of a dependent opening for the egress of urine. I have performed this operation but once, and the case is related in this work. In that instance a free incision, $2\frac{1}{2}$ inches long, was made, and no untoward circumstance occurred. In cases where puncture of the bladder is deemed requisite, I believe, as a general rule, the operation by the rectum will be the one most judicious, when retention is caused by strictures, and that above the pubes, when it arises from an enlarged prostate. The puncture of the bladder having relieved the stricture from the forcible pressure of the urine, that fluid will probably soon flow in part by its natural passage, and the obstruction will then generally yield to dilatation, but if not, I believe, the application of potassa fusa will seldom fail in effecting our object. In some cases,

where puncture of the bladder has been performed for retention from enlarged prostate, it has been found necessary to retain a tube in the wound during the patient's lifetime.

Dr. Gross, in his "Treatise on the Diseases of the Urinary Organs," quotes the following interesting statistics of ninety-two cases of puncture of the bladder :—

Puncture.	No. Cases.	Success.	Fistula.	Infiltration.	Abcess.	Hæmorrhage.	Death.
Perineal	9	6	1	0	0	1	1
Recto-vesical	28	19	3	3	1	0	2
Supra-pubic	55	49	0	0	0	0	6
Total	92	74	4	3	1	1	9

CHAPTER IX.

OPENING THE URETHRA.

THIS is, sometimes, a very simple proceeding, unattended with danger, that may be successfully adopted for the relief of a distended bladder from stricture. The simplicity and freedom from danger of the proceeding, however, are only applicable to the few cases requiring operation, in which the tissues in the locality of the obstruction are but little altered from their normal structure. In such cases the membranous portion of the urethra behind the stricture is usually, more or less, dilated whenever the patient strains to empty his bladder; and should the obstruction be no farther back than the commencement of the bulb, the operation will be easily accomplished.

To the practical genius of Sir Astley Cooper the profession is indebted for having originated this safe and easy means of relief for a distended bladder the result of urethral obstruction, an operation equally happy in its conception as in its success. In the first case of this kind operated upon by Sir Astley, in 1793, an incision through the common integuments at once exposed the dilated urethra, which was readily opened

with a lancet, and the patient at once relieved from intense suffering by a proceeding scarcely more formidable than the opening of a common abscess. How vividly does imagination picture the admiration of the spectators of this novel and beautiful operation, as remarkable for its simplicity as the facility of its execution. It will be recollected that puncture of the bladder was the usual operation previously performed on such occasions. Enviably, indeed, must have been the feelings of the surgeon who had just achieved such a triumph in his art. It may be questioned if laurel-crowned victor ever, in the full flush of conquest, felt more elated. The record of such feelings may, probably, be deemed ill placed and useless on this page—not so, if it inspire one kindred spirit to emulate that enthusiastic devotion to his duties—that kindness of heart and true nobility of soul, which rendered Sir Astley Cooper so universally beloved and admired. Like our immortal Nelson, he was the idol of his profession, and

“Left his lofty name

A light and landmark on the cliffs of fame.”

Would, indeed, that matters were always so simple in retention from urethral stricture! How many an anxious hour would then be spared both patient and surgeon! It must be admitted, however, that in cases of retention from stricture requiring operation, it usually happens that there is more or less gristly induration in the immediate seat of disease, very probably complicated with thickening of the perineal tissues from former abscesses, and perhaps one or more sinuses. In such a state, with an impermeable obstruction, the operation of opening the urethra, and subsequent introduction of a catheter, becomes a far more serious pro-

cedure. There can be no question, I imagine, when an operation is required for the relief of a distended bladder resulting from stricture, provided the tissues concerned in the proceeding, with the exception of the urethral dilatation, be but little altered from their normal state, and the patient has not a deep perineum, that Sir A. Cooper's method of relief is the best. The directions given by Sir Astley are, that a staff is to be passed as far as the stricture, and its point turned downwards; an incision must then be made upon, and beyond it, when, during the straining efforts of the patient to void his urine, the dilated portion of the urethra, being felt by the finger, should be opened with a lancet. In cases favourable for this operation, the patient during the contractions of his bladder is usually conscious of the distension of the dilated portion of the urethra, which can also frequently be felt distinctly through the rectum by the finger of the surgeon.

CHAPTER X.

INTERNAL DIVISION OF STRICTURES.—DIVISION BY THE
LANCETTED CATHETER.

IN the more intractable forms of urethral stricture which it has been found impossible to dilate, their division by the knife has, in many cases, been adopted with more or less satisfactory results. There are two modes of effecting this division :—From within, by the lancetted catheter, or other cutting instrument, passed along the urethral canal. From without, by perineal incision. Each of these operations has its supporters. Mr. Stafford has strongly advocated the division of strictures from within, by an instrument well known as the lancetted catheter. Should the obstruction be in the straight part of the urethra, within the first five or six inches of the external orifice, it may probably be divided by the lancetted catheter, without much risk, as the direction of the instrument can be ascertained with tolerable accuracy by the finger. When a stricture is in the curved portion of the urethra, this method, although it appears to have been frequently successful in the hands of Mr. Stafford and others, must, surely, be somewhat hazardous ; for where there is much con-

densation at the seat of disease, the most expert operator can scarcely be certain of cutting in the right direction.

In an irregular hard stricture, at a distance, where the finger cannot possibly distinguish if the lancetted catheter be in the direct line of the urethra, the instrument may do much mischief even when used by the ablest surgeon, for it must be by a fortunate chance should the incisions be made in the proper course. I know that many successful cases have occurred, in which the bladder has been safely reached by this method; but I know, too, that extremely untoward events have happened from the use of the lancetted catheter. In some instances, the instrument has taken a wrong course. Hæmorrhage of an alarming character has sometimes ensued; and, occasionally, extravasation of urine. In one case, which came to my knowledge, the seminal ducts were divided, and the patient rendered impotent for life. This operation has even been fatal. When cutting with this instrument through a hard and intricate passage to the bladder, we shall be somewhat in the position of the seaman without chart and compass, for, like him, although we may chance to proceed in the right direction, we shall be just as likely, if not more so, to take a wrong course. It is but proper to state, however, that Mr. Guthrie has successfully employed the lancetted catheter in some cases where the stricture was in the curved portion of the urethra, and in a manner that is certainly attended with less risk than the method usually adopted. This surgeon, with a No. 6 cutting instrument, divides merely the face of the stricture, usually its hardest part, and then introduces a No. 4 silver catheter, which he has, in several instances, succeeded in passing into the bladder.

Mr. Guthrie is an advocate, in some cases, for the division of a stricture from behind forwards, a method also recommended and practised by Mr. Leroy D'Etiolles.

Mr. Guthrie tells us that this mode of division can only be effected when the stricture is passable by a No. 4 at least ; also, that "the operation is not one of necessity, but of choice, performed in the hope that it may lead to a permanent cure," which he thinks "it is very likely to effect." The instrument used by Mr. Guthrie, he informs us, "is round, straight, and of equal size throughout unto the end, the under part of which forms a bulb or ledge sufficiently developed to catch against the stricture when passed through it, and then withdrawn until it meets with the check the inner side of the stricture occasions by catching against the edge or bulb. The cutting part being then protruded on the under side by the pressure of the thumb on a spring, the instrument is to be drawn through the stricture, which it divides ; the pressure of the thumb being removed, the cutting part returns into its sheath, or it may, if found necessary, be pushed forwards through the stricture, thus deepening and completing the cut already made, or even making another by the side of the first, if thought advisable. When the division of the stricture has been accomplished, a straight sound, very slightly conical at the point, should be passed through it, until the distension begins to give pain, when it should be withdrawn, to be re-introduced next day, until, by successive introductions, and, if necessary, by successive divisions, the canal becomes free." Mr. Guthrie, with his usual candour, informs us that, after this operation, "urine may be extravasated ; matter may form externally, or be discharged in quantity from within ;"

also, that "these are accidents which may befall any one, although they do not often occur." The following highly important observations are added by Mr. Guthrie :—"In whatever manner the urethra may be divided, whether for a stricture only, or for a fistula in perineo, any and every operation may lead to the excitement of a fever resembling ague in its paroxysms, and to the formation of matter in different parts of the body, in a similar manner to that which I believe I was the first to show did often happen after amputation. It is a misfortune that cannot be avoided, and he is fortunate in whom these depositions of matter occur in parts not essentially vital."

The latter operation, division from within, by a cutting instrument, of a stricture sufficiently open to admit the introduction of a No. 4, is one that, in my opinion, should very rarely, if ever, be performed, as the caustic potash, in such cases, will usually prove equally if not more efficient, and has the additional advantage of being used with perfect safety to the patient.

The disadvantages attending division of strictures within the urethral canal by the lancetted catheter or other cutting instruments are of no trivial kind. First, the operation is effected in the dark, it being impossible for the most skilful operator to tell exactly what he has divided; secondly, it may chance, from the elasticity of the obstruction causing it readily to yield to the pressure of the cutting instrument, that a very small portion only of the stricture will be divided; thirdly, in other cases, where the obstruction is rigid and unyielding, the incision may also divide the parietes of the urethra, and extravasation of urine ensue; lastly, even supposing the incision to have been properly effected, either posteriorly by Mr. Guthrie's instrument,

or anteriorly by Mr. Stafford's, there is still the disadvantage in division of strictures by this method, that when beyond a slight extent, they will mostly be exceedingly difficult to keep open, a great objection to the operation, even if there were none other.

After reflecting upon this subject, I think it cannot excite much surprise, that this operation should so often fail in affording permanent relief. The great majority of cases in which it can be at all justifiable, will be old, hard strictures, impassable to the bougie; and, before having recourse to it, we should well consider what is effected by its performance in such instances. Two incisions commonly, and sometimes three or four, are made by the lancetted catheter, in different parts of the hard strictured portion of the urethra, by which the surgeon is enabled to force the instrument through the obstruction into the bladder, and thus, by incision and laceration, the immediate object is perhaps gained. But to preserve this advantage, a catheter must be retained for some little time; or, if that cannot be done, a sound must be introduced, more or less frequently, to keep open the breach made in the obstruction.

It will be well for the patient, if he can bear for some few days the retention of a catheter in his bladder, as the wounded parts will then be protected in a great degree from the passage of the urine. It often unfortunately happens, however, that so much irritation is caused by retention of the catheter, that the surgeon is obliged to rely upon the occasional introduction of the sound as his only hope of keeping open the passage. What must be the effect of urine, in these cases often more irritating than usual, passing over incised, lacerated, and highly sensitive parts? Why that which any one, without being endowed with the sagacity of a Hunter,

might naturally expect—inflammation, which may so increase the condensation of the diseased tissues, as eventually to make the stricture worse than ever.

Surgeons who have practised this operation, in cases where the obstruction is of more than slight extent, know that, although it may be possible to get a No. 10 catheter into the bladder immediately afterwards, yet should it be necessary to withdraw the instrument for a time, it will often be impossible, without using injurious force, to pass one of half that size. It should always be borne in mind, that the tissues divided in this operation have a strong tendency, from their elastic nature, to close again, especially when exposed to the passage of the urine. In some of these operations, performed too by no bunglers in their art, such severe hæmorrhage has occurred, as nearly to fill the bladder with coagulated blood, and cause the patient hours of agony from retention of urine. False passages have also been made, and extravasation of urine has sometimes occurred from the operation when accomplished by those who had become most expert in its performance.

By the advocates for the use of the lancetted catheter, the account here given of the effects of that instrument, will doubtless be considered a very partial one. It may be said, and with truth, that the disadvantages, and not the advantages, have been described. The lancetted catheter has indeed always appeared to me to be a very dangerous instrument; and I feel assured, that there are seldom any advantages to be gained by it that cannot equally be obtained by safer means. I am very willing to acknowledge my strong dislike to the instrument, for in using it, beyond the straight part of the urethra, I should dread every advance it made, feeling no confidence in its taking the right course. It must surely,

under such circumstances, notwithstanding all that can be said in its favour, be a kind of stabbing in the dark, which is as likely as not to mistake its proper object.

In a hard, unyielding, gristly stricture, in the straight part of the urethra, which had resisted the application of potassa fusa, I should, however, prefer effecting division of the obstruction by the lancetted catheter to the operation by external incision.

When undertaken for the relief of a stricture in the curve of the urethra, it certainly appears to me, that the operation with the lancetted catheter is one in which the advantages that may possibly be gained are never worth the risk that must be incurred in its performance. The two following cases are, I believe, fair illustrations of the usual effects of division of strictures by the lancetted catheter; although that operation has certainly, in some instances, been attended with more satisfactory results.

CASE LI.—*Stricture which had been divided by the lancetted catheter.*

Mr. Y., aged 53, admitted a dispensary patient, August 15th, 1850. Has suffered more or less from stricture for the last thirty years. Ten years ago, during an attack of retention of urine, his stricture was divided with the lancetted catheter by an eminent surgeon, which operation relieved him for a considerable time; but he had great difficulty afterwards in keeping the obstruction which had been incised sufficiently open; and for the last four years, the patient has been unable to pass an instrument of any kind. On his application to me he had long been annoyed with dribbling of urine; and every attempt to empty his

bladder is attended with very painful straining, seldom more than a table-spoonful, which comes away by drops, being passed at a time. Applied potassa fusa to a stricture at four inches, and repeated the application every third day until the 30th, when there remained scarcely any dribbling of urine, which is now voided in a small stream. On the 5th of September, I passed a No. 5 sound into the bladder; and by the 6th of October, the stricture was sufficiently dilated to admit the introduction of a No. 8. The patient's attendance at the dispensary has since been so very irregular, that I have been content with passing for him the same sized sound.

CASE LII.—*Stricture which had been divided by the lancetted catheter.*

July 3, 1851, I was consulted by a surgeon in extensive country practice, who had long been a great sufferer from stricture, having experienced frequent severe attacks of retention of urine. Between four and five years before his application to me, he had consulted the late Mr. Liston, who divided for him an obstruction at $4\frac{1}{2}$ inches from the external urethral orifice. I was informed by the patient that Mr. Liston afterwards passed a No. 6 silver catheter into his bladder, and assured him that there was no other stricture than that which had been incised. By Mr. Liston's advice, he has occasionally kept in the urethra, for an hour or two at a time, a metallic tube long enough to pass through the divided part. The patient is obliged sometimes to ride a considerable distance on horseback, and then the difficulty in micturition is much increased, amounting often to complete retention, which is only

relieved by large doses of opium. The stream of urine, which had considerably improved after the operation, has gradually re-contracted, notwithstanding the regular introduction of the dilating tube. On examination with a No. 6 silver sound, which went with some little difficulty through the incised stricture, which was very rigid, about an inch long, and excessively painful, a second obstruction was encountered at the bulb, through which the instrument passed, after gentle pressure continued for a few minutes. The sound was very firmly grasped, and a little bleeding and irritation was caused by its introduction. This gentleman could only remain in town for a fortnight, and as his necessary avocations during that time required active exertion, I did not think it advisable to use the potassa fusa. I succeeded once in the introduction of a No. 7 sound into his bladder, which caused rather free bleeding, and so much urethral and vesical irritation, that I did not again use that size, but passed for him afterwards the No. 6, until his return to the country. I advised him not to increase the size of the instrument, until the No. 6 passed with facility. This patient was stout and highly plethoric, just the subject for hæmorrhage. I heard from him a few months afterwards, and was informed that he continued to pass occasionally the No. 6 sound, which enabled him to void his urine generally with tolerable comfort.

CHAPTER XI.

EXTERNAL DIVISION OF STRICTURES—PERINEAL SECTION.

THE words, perineal section and perineal sectionist, have of late become so notorious from the offensive personality with which they have been connected, that I would gladly avoid any farther discussion of the subject to which they relate; but that its high importance, being often a question of life or death, compels me in this place to examine strictly the merits of the now too familiar operation of perineal section.

Division of strictures by an opening in the perineum is not a modern operation, having, as it appears, been occasionally performed in this country as long ago as the time of Wiseman, by some of the ablest surgeons of their day; but only in cases in which there remained, apparently, no other chance for the relief of their patients. The operation was also performed more than a century ago by some of the French surgeons, and was called "*la boutonnière*," or button-hole incision of the urethra.

Of late this operation has been rather the fashion; and I cannot but think that it has been performed much too frequently, that is, in cases which might have been

equally benefited by safer means. Perineal section has always appeared to me to be an operation far too perilous, as well as unsatisfactory in its results, to justify its performance, except as a last resource under circumstances of immediate or imminently impending danger.

In the common method of its performance, a staff or silver catheter is passed as far as the stricture, and pressed firmly against it ; an incision being then made through the perineum upon the point of the instrument, the knife is carried backwards so as to divide the contraction, and to open the urethra beyond. A gum or silver catheter, usually the former, is then introduced and fixed in the bladder, the object of the proceeding being to procure a free communication between the two permeable portions of the urethra by division of their intervening obstruction. In cases in which the urethra, to some extent, at the seat of disease, is converted into a gristly mass, it cannot be expected that the passage made by the knife can be exactly in the track of the original channel. It is certainly just as likely to be effected through the diseased tissue by the side of the natural passage ; and it will often be very difficult to keep the new one sufficiently open for the free evacuation of the urine. This tendency in the new channel to contraction is not, however, all that is to be feared, for this operation has frequently proved fatal. That hæmorrhage may sometimes occur to a great extent, and even cause death, we have evidence in some cases in which this operation was performed by Mr. B. Cooper ; they are recorded in Guy's Hospital Reports. In the first of these cases, the man bore the operation well, but secondary hæmorrhage occurred to an extent that had nearly proved fatal. In the second case, there was considerable bleeding during the operation and afterwards ; but

it was eventually stopped by pressure on the pudic artery. In the third case, hæmorrhage proved fatal a day after the operation. In the remaining case, it is stated that a considerable quantity of blood was lost during the operation; the patient, however, eventually recovered. In some instances in which this operation has been resorted to, constitutional irritation of a grave character supervened, the patients having gradually fallen into a typhoid state, and died a few days afterwards.

Valuable information on the results of perineal section will be found in some observations on that method of treatment, by Mr. Henry Smith, in Nos. 553, 556, and 557, of the "Medical Times." In eleven of the cases recorded by Mr. Smith, the operation was had recourse to in impermeable strictures, the result having been fatal in four. In the remaining four of Mr. Smith's cases, the obstructions were permeable, and Mr. Syme's operation was performed, the strictures having been divided on a grooved staff previously passed into the bladder. In one of these cases the operation proved fatal a fortnight after division of the stricture. In the "Lancet" of June 29th, 1850, are recorded three cases in which Mr. Syme's operation was performed by Mr. Cock, division of the stricture having, in one instance, been followed by the death of the patient. Of the fatal case we are informed, that "the patient was taken to bed in a singularly depressed condition. The loss of several ounces of blood increased the prostration from which he never rallied. The next day his irritability became extreme, and he could not bear the pressure of the catheter. Symptoms like those of phlebitis soon occurred; he continued to get worse, and died five days after the operation." It

was found, on post-mortem examination, that the edges of the wound in the perineum were sloughy, and all the veins forming the left prostatic plexus more or less filled with coagula, in some parts adhering to the lining membrane of the vessels, but no pus was detected. Some of the veins constituting the right plexus were likewise inflamed. Phlebitis was at the time prevalent in the hospital. A case of perineal section, by Mr. Gay, which proved fatal on the fifth day, is recorded in the "Medical Times," of November 5th, 1850.

That perineal section, as commonly performed, is somewhat perilous, we have of late had sufficient proof. It must also be admitted that no surgeon, by the performance of this operation, can ensure a patient against a recurrence of his stricture. We have some valuable information upon this point from Mr. Guthrie, in his work on "Diseases of the Bladder and Urethra." The following statement is instructive: "In the course of the last thirty years I have had many opportunities of dividing, and more of seeing the urethra divided by others, for the relief or cure of persons labouring under strictures. In most of these cases, the disease has returned in the course of a few months, or would have returned if the patients had not made use of the solid sound regularly every five or six days to prevent it. In the year 1816, I saw the late Mr. Pearson divide a stricture at the part where the scrotum begins, for the extent of a inch, or as much as was hard and gristly. The patient got quite well, and could pass a bougie with ease; but he subsequently neglected himself, and one year afterwards I saw him as bad as ever. In some cases, however, the results of this operation have been very satisfactory, there having been but little disposition to a return of the contraction." Surely no sur-

geon of ordinary judgment would ever think of resorting to this operation except in cases of emergency, or as a last resource, when all other means of relief had been tried and failed.

In a late work by Professor Syme, that gentleman, after having strongly condemned the usual method of performing perineal section, recommends division of urethral obstructions upon a grooved director, which of course facilitates the proceeding. Mr. Syme describes his operation as "a simple and easy mode" of curing permanently the most difficult cases of stricture of the urethra, and unattended with danger to life. This operation is of course only applicable to permeable obstructions; but it appears that Mr. Syme does not believe in the existence of a stricture impermeable to instruments, as is evident in the following passage from his work: "The operation by external incision hitherto employed, has been resorted to as the refuge of awkwardness or failure in the introduction of instruments, there being no truly impermeable stricture."—P. 57.

It appears that a similar method of performing perineal section had been long ago practised in France, as will be seen on perusal of Dessault's treatise on "Diseases of the Urinary Organs," edited by Bichat. This subject, bearing upon the question of Mr. Syme's originality in his operation, has excited some discussion in the Medical Journals. I have here alluded to the fact merely as a matter of history, and not as reflecting the slightest discredit upon Mr. Syme, who, when first publishing on the subject, doubtless believed that his operation had not previously been performed.

That Mr. Syme's operation is not always a safe one has been sufficiently proved by two published cases,

attended with fatal results, which occurred in London. At one of these cases I was present during the operation, which could not have been more skilfully performed, a No. 6 grooved staff having been previously passed into the bladder. The patient, undoubtedly, died from the effects of the operation within a fortnight from its performance. In Mr. Cock's fatal case, phlebitis occurred; but it is stated that "the man was taken to bed in a singularly depressed condition," and that "the loss of several ounces of blood, a few hours after the operation, increased the prostration, from which he never rallied." In one of Mr. Syme's cases, that gentleman acknowledges the result to have been all but fatal from erysipelas.

We are informed by Mr. Syme, "First, that division of a stricture by external incision is sufficient for the complete remedy of the disease in its worst form; secondly, that in cases of less obstinacy, but still requiring the frequent use of the bougie, division is preferable to dilatation, as affording relief more speedily, permanently, and safely."—P. 58.

In a former publication I expressed my doubts as to this operation affording a permanent cure of stricture for the following reasons:—First, that the thickened tissue is not removed by the knife in Mr. Syme's method any more than in the one which had been commonly adopted in impermeable strictures; secondly, that although a grooved director in the new method is passed into the bladder as a guide to the knife, by which the central line of the urethra is more certainly preserved than when no director can be passed, yet the natural urethral membrane can form but a very small portion of the enlarged passage, the greater part of the new channel being necessarily made through

the condensed tissue at the seat of disease.—Vide the "Lancet," January 26, 1850.

Time only can, however, decide the question whether Mr. Syme's operation, in pervious strictures, be attended with more lasting success than when division is skilfully accomplished in impermeable cases; for at present we have no satisfactory evidence of the superiority, in this respect, of the former over the latter. By far the most important point, however, for consideration, with regard to Mr. Syme's operation, is as to the absolute necessity for its performance. When an instrument can be passed through a stricture, is it possible or not equally to afford relief by less hazardous measures, in which there is no risk of a fatal result? That it is so in most instances will, I think, be evident to any one who carefully reads the cases treated by me with *potassa fusa*.

It appears that Mr. Syme has hitherto performed this operation without any fatal result; but that his views regarding its curative powers are somewhat changed, is evident from the following passage in the "Monthly Journal of Medical Science," for July, 1850: "It was for the relief of those obstinate and contractile strictures that I sometime ago recommended external incision upon a grooved director, conveyed through the seat of contraction, on the ground of its being absolutely free from danger to the patient's life, certain to afford complete relief to all the symptoms of the disease, and probably sufficient, in general if not always, to protect him from future inconvenience." If a bougie be permitted to remain in these "obstinate and contractile strictures," but for "one or two seconds," then indeed the knife must often do the work which the bougie is not permitted to accomplish. I must once

again quote Mr. Syme: "It is now universally admitted that the bougie acts by exciting a degree of irritation sufficient to produce absorption of the thickened texture, which occasions the contraction and induration concerned in the formation of stricture. To produce this, the instrument should be employed with the utmost possible gentleness, and should not be allowed to remain in the urethra more than one or two seconds."

This is, indeed, a harmless employment of the bougie; but is it an useful one? Is it, in fact, giving the instrument a fair opportunity of accomplishing all that it is capable of doing? I think not. Does the bougie, let me ask, always act as an irritant? If it indeed be so, it must be like blowing hot and cold with the same breath, for the effects of the bougie are frequently most soothing, in fact, allaying irritation in a remarkable degree. In cases of retention of urine, is not the mere pressure of the bougie against a stricture occasionally successful in relieving the patient? And when the point of the instrument can be made to penetrate the obstruction, if retained for a few minutes, the urine will, in general, most assuredly follow the removal of the dilating power. Are these effects to be regarded as simply that of an irritant? Surely there must be some other action of the bougie than that of "exciting irritation, and causing absorption of the thickened texture." Has not the mechanical dilating power of the instrument much to do in so quickly affording relief? If, however, the bougie be retained for one or two seconds only then indeed it may possibly have no other action than that of a slight irritant.

There is scarcely, I believe, any other surgeon experienced in the treatment of stricture, who would not protest against such a frivolous use of the bougie.

What were Mr. Hunter's views of this instrument? The following are his words: "The cure by dilatation is, I imagine, principally mechanical when performed by bougies, the powers of which are, in general, those of a wedge. However, the ultimate effect of them is not always so simple as that of a wedge upon inanimate matter, for pressure produces action of the animal powers either to adapt the parts to their new position, or to recede by ulceration, which is not so readily effected."

When contrasting the freedom from fatal results of Mr. Syme's cases of perineal section with the statistics of the same proceeding had recourse to in London, the difference may probably be, in some degree, accounted for by patients bearing operations better in the more bracing air of the former than in the latter city, although even there, it appears one fatal case has occurred. (See the "Monthly Journal of Medical Science," for March, 1851.) That other eminent Edinburgh surgeons regard Mr. Syme's operation in a very different light than himself is evident from the lately published work upon Stricture by Professor Lizars, and from some "Remarks on the Treatment of Stricture of the Urethra by Perineal Incision," by Mr. Miller, Professor of Surgery in the University of Edinburgh, contained in the "Lancet," March 22nd, 1851. From the latter it may be useful to quote the following statement:—"But fatal results have occurred, in other hands, both in London and in Edinburgh. And it is not easy to see how a certain amount of risk can be avoided in such an operation. 1. By hæmorrhage: no doubt the safety here is to cut in the centre, and only in the condensed and solidified tissues which compose the stricture. 2. By urinary infiltration: and we know that very little of

this may prove fatal, the urine acting as an intense poison on the system. 3. By abscess in or near the wound, leading perhaps to fistula, and irritative or hectic fever ensuing. 4. By intro-pelvic abscess. 5. By erysipelas. 6. By pyæmia."

In illustration of such risks, Professor Miller relates the following case of a gentleman attended by himself and Mr. Syme, perineal section having been performed by the latter, on the last day of January, 1850:—"After the operation, suppression of urine took place during twenty-four hours, along with unpleasant symptoms of shock. Fever set in, accompanied by pervigilium, and great general uneasiness. After forty-eight hours, the catheter was removed. On February 3rd, the constitutional disturbance became extreme, as indicated by violent sickness and vomiting, rigors, loss of voice, cold blue surface, feeble pulse, and recurrence of suppression of urine. After about twelve hours' continuance, these symptoms yielded to stimulants. Feb. 5th.—There was great uneasiness about the scrotum and perineum, and on the 7th an abscess had formed in front of the wound. This was opened, and through the aperture urine as well as pus were discharged; the former continuing to pass through this wound as well as through the original one for many days. The greater part of the urine, however, came per urethrum, in a flat yet free stream, and without that peculiar distress to which the patient had previously been so long accustomed. When the wounds had nearly closed, a bougie was passed; but the effect was to re-open the wound, with increase of pain in the urethra. And in consequence, at the urgent solicitation of the patient, the bougie was refrained from till a more advanced period of the case.

Feb 22nd.—The urine had become very loaded and fetid, and continued to be of a depraved character for nearly a month. Up to this date, “no appreciable sleep had been enjoyed; the patient never knew that he had slumbered, even in broken rest, for one moment; and he was reduced to skin and bone; and now began to feel great discomfort in lying on his right side. At the same time, intense pain recurred in the rectum after stools. These symptoms increased; and on the 15th of March, I detected a large abscess pointing in the rectum, about two inches from the anus, and mainly occupying the right side of the pelvis. This I immediately evacuated, with instant relief; and the patient, with the aid of morphia suppositories, was afterwards blest with the first genuine night’s rest since the 30th of January.” The abscess continued to discharge for about three weeks; and at the end of that time, the presence of matter could no longer be detected in the stools. On March 31, the wounds had been closed for fourteen consecutive days, and accordingly it was deemed safe to pass the bougie. Nos. 8 and 9 were insinuated with great gentleness; but next day the perineum was again inflamed, abscess formed, and once more the urine was discharged in front by the opening in the scrotum. From this date, however, the patient gradually recovered. He left Edinburgh for the south on the 18th of May, with the perineum quite closed, and passing his urine in a very satisfactory way. In July he returned, to have a bougie passed; and a No. 9 entered without difficulty or evil result. “The contraction of the urethra, however, was by no means permanently cured;” and, accordingly, on the 9th of November, the regular use of bougies was commenced, with the view of securing final and full dilatation.

"At first, I passed No. 6 with difficulty, but No. 12 now enters without obstruction ; and the patient himself having acquired the power of occasional introduction, his cure may be considered complete."

In a clinical lecture on Stricture of the Urethra and Perineal Section, by Professor Fergusson, published in the "Medical Times and Gazette," March 13th, 1852, that gentleman, in his remarks on perineal section, observes : "I myself have seen death result from it, and also danger of the worst possible description ; and am so impressed with this, that I must beg of you to be very cautious before you resort to this so-called perineal section." Mr. Fergusson mentions the following case as being "one of the most satisfactory" he ever had :—
"The gentleman was at first under the care of the late lamented Mr. Liston, who treated him by bougies with relief. At that surgeon's death he came under my care. His chief symptom then was a succession of aguish fits, which were most violent ; and, in fact, the patient himself thought that he had regular ague. However, I found that he had a very troublesome stricture. There was excessive irritability when an attempt was made to pass instruments, and it was followed by a severe attack of shivering. No benefit was derived by the attempts at dilatation, although I could pass a No. 3 or 4 catheter ; and it appeared to me that the patient's constitutional suffering was entirely dependent on the state of his urethra. With a view of effecting a permanent cure, I proposed to him that I should cut his stricture, and relieve his ague at the same time. The operation was done ; the patient had no bad symptom after it, and all his previous distress went away. This is now three years ago ; within the last twelve months, however, some of his

former bad symptoms have returned, in consequence of his having neglected to pass bougies ; and he has lately been to town to have instruments passed, as the stricture had again contracted."

The hazards incurred by those who submit to Mr. Syme's proceeding, are accurately stated by Professor Miller. It is only within the last few months, that a gentleman, on whom the operation had been performed by a London surgeon, very narrowly escaped death, in consequence of the profuse and protracted hæmorrhage which occurred ; whilst in another case, that of an hospital patient of Mr. Coulson's, on whom the same operation was resorted to, death ensued on the twelfth day after its performance, from phlebitis. In the account of the fatal case, which is described in a clinical lecture on Perineal Section, published in the "Lancet," for June 19th, 1852, amongst other particulars, we learn, that "on cutting into the corpus spongiosum penis, this structure exhibited purulent deposits, large, and dispersed abundantly throughout its substance. The prostatic and vesical plexus of veins had evidently been the first part of the vascular system affected by the purulent contamination ; for some of the component vessels were large, and contained half-coagulated blood ; others had their coats thickened, were patulous, and had evidently held pus."

When it is recollected that the incision, in perineal section, is made through diseased tissues, and not, as in lithotomy, in healthy structures, the occasional occurrence of phlebitis or erysipelas cannot excite surprise ; but how very rarely are such accidents the results of the latter !

It has now been sufficiently shown that all surgeons have not had the same good fortune as Mr. Syme in

their operations for division of strictures by perineal section, when performed according to his method. The mischance which has occurred to others may soon happen to him. However skilfully perineal section may have been effected, who can insure his patient from the occurrence of erysipelas, or phlebitis? What degree of human care or foresight can so brace up the cords of life to the enduring point as always to guard against a fatal prostration? It may be that a patient has to submit to perineal section, whose vital powers have been so depressed by long suffering, that the loss of but a few ounces of blood may be sufficient to turn the scale against him. Surely it must be a strange perversion of reason, when gentlemen, well knowing the deplorable results of Mr. Syme's operation, continue to speak and write of it as being perfectly safe and satisfactory in its effects. With the late calamitous terminations of this operation, like beacon-lights to warn us of its dangers, I cannot but think that we are bound by every means in our power to relieve a stricture patient before having recourse to the knife.

There are some remarks of the late Mr. Aston Key, regarding operations, that we shall all do well to bear in mind. They occur in "Guy's Hospital Reports." When alluding to division of the prepuce in phymosis, Mr. Key observes:—"As the knife is at all times but an indifferent substitute for skill, and should ever be avoided if possible, the circumstances rendering it unnecessary are not beneath consideration." Taking these words for our text, let us endeavour to ascertain under what circumstances the surgeon may be justified in submitting a patient to perineal section; for there are, undoubtedly, cases, fortunately of rare occurrence, in which that operation will afford the only chance of

relief; and there are others, equally rare, in which it may, probably, be the most judicious proceeding.

In some strictures, from mechanical injury of the urethra, followed by more or less sloughing of the injured parts, a hard, gristly cicatrix may be left, while the greater portion of the urine is, probably, passed through fistulous orifices in the perineum. In such a case, dilatation and caustic may fail in the best hands, and division of the obstruction by perineal section, be the only chance of relief for the patient. Where the urethra has been divided by a wound in the perineum, a hard cicatrix may be formed at the seat of injury, and the contraction cannot be kept sufficiently open by other means to insure the patient from danger, division by the knife may become advisable, although that proceeding will not always be successful; for so strong a tendency have cicatrices to contract, that although great care be taken, by constant introduction of instruments, to preserve the advantage which has been gained by the operation, yet the stricture may return nearly, if not quite, as bad as ever. A case of hard, contractile stricture, not the result of mechanical injury, which has long remained impermeable to all milder means of treatment, and where the patient's general powers are suffering severely, the operation of perineal section may be advisable.

I have stated the above as instances in which perineal section may possibly be necessary; for, although the potassa fusa has succeeded in many such cases, who can calculate upon invariable success with any one method of treatment? I believe, however, with the exception of cases in which a portion of the urethra is obliterated after the sloughing of a part of the canal, or when a hard, contractile cicatrix is left, from complete division

or laceration of the tube, that perineal section will rarely be necessary. With regard to Mr. Syme's operation, it is at present my conviction, that when an instrument, however small, can be passed into the bladder, the persevering application of caustic potash will accomplish more enduring good for the patient, if there be time for its operation, and life be placed in no immediate peril, than can be effected by perineal section, and without the slightest risk of a fatal occurrence. My reasons for such an assertion are, that I have lately, by the application of potassa fusa, succeeded in several cases when no hope had been held out to the patients but perineal section; and in two of them, both nitrate of silver and caustic potash had been used, but the latter neither with that confidence nor perseverance requisite for its efficient action in such cases.

As a proof of what can be accomplished by dilatation, when properly and perseveringly employed, we have a striking instance mentioned by Sir B. Brodie in his valuable lectures on the "Diseases of the Urinary Organs." In that case the patient had a stricture which was surrounded by a mass of hard substance, that could be distinctly felt in the perineum, apparently from one inch to $1\frac{1}{2}$ in length. The stream of urine was of the smallest size. For many years before the patient applied to Sir B. Brodie, no instrument had been passed into the bladder. The method adopted in this case was firm pressure made by a solid silver sound as described in a former part of this work. Sir Benjamin informs us that he at last succeeded in getting an instrument into the bladder, but not until he had persevered in the treatment for more than a year.

When retention of urine occurs in a patient who has long suffered from stricture, and it becomes necessary

to relieve the bladder by an operation, division of the obstruction by perineal section, may, under peculiar circumstances, be the procedure which appears to offer the greatest advantages to the patient. If the stricture for some length of time previous to the attack of retention should have been impermeable to instruments, whilst the urethra, and its contiguous tissues are thickened to a considerable extent, combined with fistulous openings, then it may be desirable for the patient to incur the risk of a free division of the obstruction by perineal section. If, on the contrary, retention should take place, and an operation become indispensable, when the stricture has previously to the time of the attack been permeable to the smallest instrument, or if impermeable, and there be no great extent of thickening of the perineal tissues, I generally prefer relieving the patient, either by simply opening his urethra behind the obstruction, or by puncturing his bladder, and afterwards dilating the stricture. The former operation is undoubtedly to be preferred when the urethra is dilated behind the stricture, as the proceeding is then very simple. If, however, the membranous portion of the urethra should be constricted, which is frequently the case, then the bladder should be punctured, either by the rectum or above the pubes, the former being the preferable method when there is not much enlargement of the prostate gland.

Unless the urethra be dilated behind the stricture, I believe the operation of opening the membranous portion of the canal is a much more hazardous proceeding than that of puncturing the bladder. In a case of retention from stricture of forty years' duration, complicated with an enlarged prostate, I punctured the bladder above the pubes instead of having recourse to

the more formidable operation of perineal section. Within a month from the time of the operation I could pass a No. 6 bougie into the bladder.

Several cases of retention from stricture have been recorded by Sir E. Home, in which he punctured the bladder by the rectum, and afterwards readily dilated the obstructions which had previously been impermeable.

From all I have seen and read of division of strictures by perineal incision,—from my knowledge of the powers of potassa fusa in the removal of urethral obstructions, there are few cases of retention of urine from that disease, in which, were an operation indispensable, I should not prefer puncturing the bladder. Let me add, however, that this operation will very rarely be required in cases of retention, as most of them will yield to the free use of opium. It has fallen to my lot to have seen a great many cases of retention of urine, but in two instances only have I been compelled to puncture the bladder. When the effects of the caustic alkali in the cure of strictures become generally known, I venture to predict that their division by the knife, except when the result of mechanical injury, will not often be practised.

From Mr. Syme's position as a teacher, his strong recommendation of perineal section in strictures which do not readily yield to dilatation, appeared to me as being so likely to lead to fatal results in the hands of others, that I have considered it a duty to comment freely upon his views relative to the treatment of urethral obstructions. With regard to the somewhat startling assertion, "that there is really no impermeable stricture except from the awkwardness of the surgeon," I have only to observe, that cases of stricture occasionally occur in this metropolis, in which surgeons of the

highest rank not unfrequently fail in their attempts to pass an instrument through the obstruction. In a hard gristly stricture, which has long been impervious to instruments, I can readily conceive it possible for Mr. Syme, with a very small grooved director or sound, gradually to find his way to the bladder, but it appears to me that such an instrument will be more likely to pass by the side of the obstruction, where there is least resistance, than through it. Daily experience convinces me more and more that perineal section is an operation that should never be performed whilst there remains a single chance of a successful result from less hazardous measures.

The above observations on perineal section have been written in no controversial spirit, but with an anxious desire to place fairly before the profession the various perils which have resulted from its performance. I have endeavoured conscientiously to discharge a public duty, by offering such remarks as appeared to me most likely to cause surgeons to reflect well before having recourse to that operation, either according to the method commonly adopted in impermeable, or that recommended by Mr. Syme in permeable obstructions. Previous to the performance of an operation for the division of a stricture, whether permeable or impermeable, let me earnestly entreat every surgeon, in justice to his patient, first to give the *potassa fusa* a fair trial; when, if after due perseverance in its use, that remedy should fail, then, but not until then, in my opinion, will such an operation be justifiable. It is surely a good maxim in surgery, that when relief can equally be obtained by two methods, the one imperilling life, the other not, the safe means should always be chosen.

Let me not be misunderstood; for, although I have

used my best endeavours to dissuade surgeons from having recourse to perineal section, except in the very few cases of stricture that cannot otherwise be more safely relieved, it has been far from my intention to say anything in disparagement of operative surgery, which, when ably and judiciously employed, amply merits, and will ever obtain the admiration of all who can appreciate the untiring industry and high mental qualifications necessary to form an accomplished operator. By gentleness and perseverance, however, in the means which I have ventured to recommend in bad cases of stricture, the surgeon may rest assured he will generally be successful, without resorting to the knife. It is true that in the unostentatious exercise of his art, he cannot hope to obtain that applause which the dexterous performance of an operation is sure to excite, yet his reward will be no less enviable, and far more lasting—an approving conscience !

CHAPTER XII.

TREATMENT OF THE DIFFERENT KINDS OF STRICTURE.

DILATABLE STRICTURE.—This stricture seldom offers any difficulty in its management ; a few introductions of the bougie being all that is generally required for its removal. Either the plaster bougie or sound may be used, whichever gives least pain to the patient. If the urethra should possess but little irritability, the bougie or sound may be passed every second or third day, the size of the instrument being gradually increased. A dilatable stricture is often rapidly cured ; five or six introductions of the bougie being sometimes sufficient for the restoration of the strictured portion of the urethra to its healthy size. To guard, however, against a relapse, it will be prudent to pass a full-sized bougie once a week for some little time, and then at intervals of a month. As a general rule, applicable to all kinds of stricture, it may be as well at once to state, that, except in cases of retention of urine, whenever the introduction of instruments causes much irritation, their use should be discontinued until such irritation be relieved. This form of stricture commonly requires but little medical treatment. If, however, from the intro-

duction of instruments, or other causes, the stricture becomes irritable or inflamed, it may be necessary to have recourse to the remedies usually employed for the relief of urethral irritation.

SIMPLE CHRONIC STRICTURE.—The degree of difficulty in curing a stricture of this kind will depend principally upon the nature of the obstruction. If the mucous and submucous tissues only of the urethra are thickened, the disease will more readily yield than when either the fibrous structure of the canal is affected, or the cells of the corpus spongiosum have become condensed by effused lymph. Commonly in proportion to the hardness and extent of a stricture, will be the difficulty in its removal. An old, firmly contracted, extensive fibro-cartilaginous stricture will be the most difficult of all to cure, it being commonly very slow in yielding to the bougie, and remarkably prone to return if the use of the instrument be omitted. Strictures, as well as most other local diseases, are often much influenced by the state of the constitution.

From the preceding observations the conclusion naturally follows, that upon various contingent circumstances will depend the length of time required for the cure of a stricture, and that it is impossible to form an accurate opinion upon the subject merely from the size of the instrument which can be passed into the bladder. Especial care should always be taken that in a too anxious desire to dilate a stricture, we do not do more harm than good by causing irritation; which error every surgeon, much accustomed to the management of the disease, must have occasionally committed.

The object of the surgical treatment is, of course, to restore the contracted portion of the urethra to its healthy calibre, which is usually effected by the intro-

duction of dilating instruments. In many cases the introduction of instruments may be advantageously repeated every second or third day; but should irritation ensue, their use must be discontinued until its cessation. If, however, the irritation continue, so as to prevent, for some length of time, the further dilatation of the stricture, two or three applications of potassa fusa will often be found the most efficient means for its relief. When a stricture is predisposed to irritation, if the patient's avocations will not permit him to rest during the day, the bougie or sound should be passed in the evening. In cases where the contraction is so great as to admit only a very small instrument, it will be best to use a silver catheter; and if a No. 2 or 3 can be got into the bladder, it may sometimes be retained for twenty or thirty hours with advantage, should no irritation of consequence follow.

Great care must be taken in the introduction of very small silver catheters. Extremely gentle pressure only should be used until the point of the instrument has entered the stricture, which will be known by its being grasped, and when increasing the pressure it is easy to ascertain if it be in the right direction by attempting slightly to withdraw the catheter, which is sure to be tightly held if in the contracted portion of the urethra. This precaution is especially necessary, for the stricture being usually much the hardest part of the urethra, a degree of pressure, which can be safely used when the instrument has fairly entered the obstruction, might act injuriously upon other parts of the canal. The attempt to pass the catheter onwards should be persevered in from ten to twenty minutes if necessary, bearing in mind that an obstruction may be gradually dilated without injury, when, by a more sudden effort,

the urethra would most probably be torn. If the lining membrane of the urethra should be lacerated, an occurrence which is generally very perceptible, it will be proper to withdraw the instrument, and leave the canal undisturbed for a few days, that the laceration may have time to heal before another attempt be made to dilate the stricture.

It has been previously stated that it is always desirable strictures should be dilated to the full size of the healthy urethra, and when, from the effects of former ulcers, or from malformation, the urethral orifice is contracted, it should be enlarged downwards with a straight bistoury. Care must be taken that the incision does not unite; and for that purpose a short piece of bougie should be kept fixed in the urethra for a few days, withdrawing it of course during micturition. Although desirable to dilate a stricture to the full size of the healthy urethra, it is not prudent to do so in all cases. In some firm strictures which had long existed, I have observed that when sufficiently dilated to admit a No. 8 or 9 bougie, all attempts at further dilatation did more harm than good, by invariably causing so much irritation, as to increase the contraction for a time, and without any subsequent good effects. Under such circumstances all that is necessary to be done is to keep the stricture as open as possible by desiring the patient to pass for himself, or to have passed for him, as large a bougie as can be used without irritation, once a week or fortnight, as may be necessary. Should, however, any tendency to re-contraction beyond this point occur, a few gentle applications of *potassa fusa* will usually be all that is required.

The following interesting case, mentioned by Mr. Guthrie, is a good illustration of this kind of stricture :

"A gentleman came under my care, with stricture five inches from the orifice of the urethra, through which a solid silver bougie could not be passed, although a similar sized soft one could, and this peculiarity remained until his death, which took place last year. Whenever the canal contracted a little a solid bougie would not pass; whenever it was dilated, so as to admit a No. 10, it would then pass, although not so easily. This gentleman died of apoplexy, having been in the habit of passing a bougie twice a month or oftener, and of showing himself to me every year or two years, and I had the opportunity of examining the urethra. For the extent of an inch the canal was altered in colour and appearance, being yellower and rougher than the remaining part, and the wall a little thickened generally, but there was no particular thickening at any one part, so that the disease, in all probability, arose from inflammation attacking the urethra for the extent of an inch, and giving rise to a similiar alteration for the same distance. The sensation communicated on passing a bougie was that of its going over a rough hardened surface for some extent, and the dissection proved the fact."

Such cases are, however, exceptions to the general rule, for the instances are, I believe, but very few in which, by a judicious use of the caustic alkali, strictures cannot be dilated to the full size of the healthy urethra. If, from the introduction of instruments, or from indiscretion in the patient, irritation of the stricture ensue, the treatment previously described for its relief should be adopted.

During the whole of the treatment, it will be proper to have the bowels kept gently open by that kind of aperient which best agrees with the patient. The urine should be frequently tested, and, if necessary, such

remedies must be employed as are best calculated to restore it to a healthy state. Exercise on horseback should be avoided in all cases of stricture, except very slight ones ; and even then, it is better dispensed with. Moderate walking, or riding in a carriage, will, however, be found beneficial in improving the general health. Exposure to cold damp weather should be avoided as much as possible ; and during the winter, as well as the greater part of spring and autumn, the patient should wear flannel next his skin ; changing it for a lighter kind of that material during the summer months. These precautions may appear trivial ; but should a stricture be much contracted, irritable, or inflamed, by keeping the surface of the body warm, an attack of retention of urine will frequently be prevented.

IMPASSABLE STRICTURE.—The great object in this, as in other strictures, should be, of course, to restore the urethra, as nearly as possible, to its healthy integrity. The accomplishment of this desirable object will, however, require, in many cases, no inconsiderable degree of skill and judgment in the surgeon ; for unless great gentleness and caution be used in attempting the introduction of instruments, so much irritation may be excited in a stricture as to render it equally impervious to the urine as to the bougie. When a patient applies for relief with a stricture, which on examination is found to be impermeable to instruments, although permitting the urine to trickle through it, before attempting a second time to pass a catheter or bougie, such remedial measures should be adopted as are best calculated to allay urethral irritation. After having waited for a few days, I generally try to introduce a small silver catheter ; but if it will not enter the stricture, I endeavour to introduce the smallest sized bougie. If

unsuccessful, after gentle and persevering efforts to get an instrument into the bladder, I then have recourse to the application of potassa fusa, which, as before stated, has proved to me a most valuable remedy in such cases.

Generally, after a few applications of potassa fusa to an impervious stricture, a No. 2 or 3 silver catheter can be passed through it; and if there be no second stricture, or disease of the prostate, the instrument will pass on into the bladder. If the armed bougie should pass through the stricture, it must be instantly withdrawn, and replaced by another which is unarmed. Should there have been much difficulty in getting an instrument into the bladder, it should be retained, if practicable, for several hours, or for a day or two, when but little irritation is caused by its retention.

Each day's experience convinces me more and more, that nothing good is to be gained by employing so much force as to tear through the obstruction; for, besides its liability to cause retention of urine, the necessary healing process will retard the cure of the disease. So convinced am I of the propriety of proceeding with extreme gentleness in these cases, that I prefer using the potassa fusa a few extra times, to incurring the risk of tearing the stricture by premature efforts to pass an instrument through it.

Although the greatest difficulty will have been surmounted when an instrument has been passed into the bladder without violence to the stricture, yet the remainder of the treatment will not always prove entirely free from difficulties. It is very easy to talk of gradually increasing the size of the instrument on each successive introduction, but not always so easy to be accomplished; for it often happens, that, after having at one time succeeded in passing a No. 4, on the very

next attempt to introduce the bougie, it will be impossible to get a No. 3, or, possibly, one of the smallest size, even to enter the stricture. However gently an instrument may be passed through a highly contracted stricture, from the irritation which is sometimes unavoidable, congestion or inflammation of the lining membrane will follow, so as, for some little time, to render fruitless any attempt to penetrate the stricture without doing mischief. Under these circumstances, two or three mild applications of potassa fusa, by relieving inflammation or congestion, will often produce the very best effects.

The difficulty in dilating a stricture, although depending greatly on its extent and hardness, will be much increased by its irritability and predisposition to inflammation. The stricture, if hard and extensive, and especially if particularly irritable, must be very cautiously dilated. In some cases, the transition from the introduction of an instrument to that of the next size higher in the scale, will often produce so much irritation as for a short time to increase the contraction. It will be found very useful in practice, particularly for surgeons who depend exclusively upon dilatation in the treatment of stricture, to have bougies, sounds, and catheters, made of intermediate sizes of the common scale of the instrument-makers, as the gradation, according to that scale, is sometimes greater than a stricture will bear without irritation. The common effect of over-distension of a stricture is inflammation, with a muco-purulent discharge, often mixed with blood. The inflammation frequently extends along the ejaculatory ducts to one or both testes. Retention of urine is also very likely to ensue from too much stretching a stricture.

After having, with the aid of *potassa fusa*, succeeded in getting an instrument into the bladder, there may be no further necessity for the use of that remedy, unless the stricture become irritable, or but little progress be made in its dilatation, when the potash may be re-applied with great advantage. The introduction of a bougie sometimes causes irritation external to the urethra, and subsequently abscess; if so, the canal should be left undisturbed by any instrument until an outlet be given to the matter, either by art or nature, unless retention of urine render the introduction of the catheter necessary for the patient's immediate relief.

If it be thought desirable to take a cast of the face of a stricture before using the *potassa fusa*, this can be done by the introduction of a model bougie. Care must be taken that an enlargement of the prostate gland be not mistaken for a stricture. I have known such a mistake occasionally to occur, when after ineffectual endeavours to pass a small bougie beyond seven or eight inches, a full-sized prostate catheter has been readily introduced into the bladder. As stricture may be complicated with enlargement of the prostate, the state of that gland in persons advanced in life, should, as far as possible, be ascertained.

It is in the impassable stricture that attacks of retention of urine are most to be feared, consequently, every precaution should be taken to prevent their occurrence. As these attacks usually result from an accession of inflammation or congestion of the lining membrane of the stricture, every means must be adopted for their prevention. The treatment required, should retention occur, will be found described in its proper place.

IRRITABLE STRICTURE.—The surgical treatment of this stricture must be conducted with very great gentle-

ness, or the patient will be but little benefited. In many cases of irritable stricture, the potassa fusa will be found very serviceable, as three or four applications of the caustic will mostly diminish, if not entirely remove, the irritability. An irritable stricture often bleeds on the introduction of a bougie, but this hæmorrhagic disposition seldom continues after a few mild applications of potassa fusa. Any stricture, although not naturally irritable, may become so, either from constitutional disturbance, an unhealthy state of the urine, or from want of judgment in the use of instruments. It not unfrequently happens, that after having succeeded to a certain extent in dilating an old gristly stricture, which kind of obstruction is not usually very irritable, that no further progress can be made ; for when attempting to increase the size of the dilating instrument, so much irritation follows as for some little time to increase the contraction. In such a case, a few applications of potassa fusa will generally enable the surgeon to go on with the dilatation. If, notwithstanding the application of the caustic, the stricture continues too irritable to permit further dilatation, then it will be best entirely to desist for some little time from the use of instruments, and to employ the general measures recommended for allaying urethral irritation. It is probable that after a few weeks' rest, the stricture will yield to the gentle use of the bougie, assisted by occasional mild applications of potassa fusa.

It is in irritable strictures that rigors are most likely to occur soon after the introduction of instruments ; and it is in such cases that Sir B. Brodie has recommended the retention of the gum catheter, which by preventing the urine from passing over the irritated lining membrane of the stricture, has put a stop to their recur-

rence. In many such cases, however, I have eventually succeeded in dilating the strictures by an occasional application of potassa fusa, by prolonging the intervals between the introduction of instruments, and by employing such general remedies as most effectually relieve urethral irritability and inflammation.

From what has been previously observed, it can readily be imagined that the treatment of irritable strictures requires the greatest degree of patience, judgment, and forbearance in the surgeon. Great advantage is derived from the administration of opium. Much good will often be effected by giving the patient five grains of Dover's powder, ten of powdered gum arabic, and ten of sesquicarbonate of soda, in a little barley-water, twice or thrice daily, unless the urine be alkaline, when the soda should be omitted. Leeches applied to the perineum are sometimes useful; but I seldom now have recourse to them, having found an occasional application of potassa fusa, in most instances, much more efficient, and not debilitating to the patient. As this kind of stricture frequently occurs in persons whose general health is impaired, more especially from residence in warm climates, such measures should be adopted as are best calculated to improve the state of the patient's constitution. Vegetable acids, salted meat, or highly seasoned food of any kind, as being too stimulating to the urinary organs, should be avoided by persons with irritable strictures.

In many cases, suppositories, containing from one to three grains of opium, or opiate enemata, composed of from forty to sixty drops of tincture of opium, in two or three ounces of warm gruel, are exceedingly useful. The same precautions as previously recommended should be taken to guard against cold or vicissitudes of

temperature. In persons predisposed to rigors, the administration of an opiate just before, or soon after, the introduction of an instrument will often prevent their occurrence. If there be no disposition to retention of urine, and the nervous system of the patient be much depressed, from twenty to thirty drops of tincture of opium in a little warm brandy and water, will be the best mode of giving the opiate. The administration of quinine with diluted sulphuric acid, in some warm aromatic water, is often useful in removing the irritability of constitution favourable to the occurrence of rigors. If the quinine fail, small doses of the liquor potassæ arsenitis may succeed, or a combination of the two remedies. Of all the means, however, whether local or constitutional, we can employ for preventing the occurrence of rigors after the introduction of instruments, I am fully satisfied that there are none so effectual as a few gentle applications of potassa fusa.

INFLAMMATORY STRICTURE.—In this stricture no surgical interference with the urethra is proper, unless retention of urine should occur. Even then, however, many surgeons, from a fear of increasing inflammation, strongly object to the use of the catheter, and prefer having recourse to every other means of relief before attempting its introduction. I believe that no such fear need be entertained, for the constant straining of the patient, as well as the spasmodic contraction of the bladder, will do much more harm than the contact of an instrument with the inflamed urethral membrane; besides, the immediate relief which invariably ensues, if a catheter can be got into the bladder, most satisfactorily establishes the propriety of the practice.

As being the least likely to cause irritation, a small gum catheter without its stilet, is the best instrument to

use, and should therefore first be tried. The abstraction of blood from the perineum, either by leeches or by cupping, is a very essential part of the treatment, the whole of which should be strictly antiphlogistic, aided by rest in the horizontal position. The patient should be desired to drink freely of barley-water; and proper doses of Dover's powder, soda, and gum arabic, administered every third or fourth hour, will generally afford great relief. Warm fomentations to the perineum, or the warm hip-bath, are usually productive of much comfort.

STRICTURE WITH MARKED DISPOSITION TO CONTRACTION.

—In the management of this stricture which may be called the contractile, I have seen great benefit produced by the occasional application of potassa fusa. When the stricture has been fully dilated, the patient should be particularly cautioned as to the necessity of his continuing the regular introduction of the bougie. If irritation or inflammation occur during the dilatation, they must be combated by the means previously recommended; and it is scarcely necessary to observe that attention should be paid to the state of the patient's general health during the whole course of the treatment.

SPASMODIC STRICTURE.—The surgical management of this stricture should be very similar to that of the irritable, the latter being remarkably predisposed to spasm. When introducing instruments in strictures subject to spasm, they should be lightly and quickly passed down to the obstruction, which, if thus taken by surprise, will often yield; whereas, by a more slow proceeding, the bougie would very probably either not enter the stricture, or if it did, might then be so firmly grasped as to prevent its further advance. I have found the potassa fusa very useful in diminishing the tendency to spasm, as well as relieving it when present, a few gentle ap-

plications of the remedy once or twice a week having been often attended with signal advantage. I have, in fact, found that the caustic potash has proved by far the best antispasmodic.

Opium is a most valuable remedy in this stricture ; and may often be given with great advantage, not only by the stomach, but in the form of suppository or enema. The warm bath, hot fomentations frequently applied to the perineum, with the occasional application of leeches to the same part, the free administration of opium, or other narcotic, combined with ipecacuanha and camphor, at bed-time, followed by a gentle aperient in the morning, and the general regimen not too stimulating, comprise the principal means to be relied upon in the medical treatment. In no stricture is attention to the state of the urine more necessary than in this. I have previously observed that a purely spasmodic stricture of the urethra, according to my experience, except from irritation of the neighbouring parts, is not of very common occurrence. That in most spasmodic strictures the lining membrane at the seat of disease will be found morbidly sensitive. It is in such cases that the potassa fusa has been so beneficial. In a purely spasmodic stricture, instruments should be introduced only from their indispensable necessity for the relief of retention of urine. The treatment in such a case must, of course, be directed to the removal of the cause of the spasm, whatever that may be.

STRICTURE FROM LACERATION, OR OTHER MECHANICAL INJURY OF THE URETHRA.—The common causes of this injury have been previously stated, and that it is often productive of strictures of the most unyielding character. The symptoms are, in general, sufficiently well marked to attract attention to the mischief that has occurred.

If soon after the reception of an injury in the perineal region, blood be discharged from the urethra, there can be little doubt of the nature of the accident, especially if there be also difficulty or inability to void the urine. Should the urethra be merely bruised, without laceration, there will be freedom from hæmorrhage, as well as from the severe scalding sensation experienced during micturition, when the urine passes over the lacerated part.

In severe mechanical injuries of the urethra, there is always more or less difficulty in micturition, if not complete retention. When the mischief has arisen from force applied externally, there will be usually a sense of tension in the perineum, with some tumefaction, as well as a red or purple colour of the skin, extending possibly to the scrotum and penis. The urethra may, however, be severely injured from without, and the integuments of the perineum maintain their natural appearance.

In a case of lacerated urethra, if there be no external opening, or the opening, should such exist, be small, prompt measures must be adopted for the prevention of extravasation of urine ; or for mitigating its effects, should the misfortune already have occurred. The more extensive the urethral laceration the greater will be the chance of mischief from urinary infiltration. The danger more immediately to be feared from lacerated urethra is that of infiltration of urine, the occurrence of which must, if possible, be prevented. If there be a free external wound communicating with the urethra, the greater part of the urine will pass through the opening, and urinary infiltration need not then be dreaded. A full-sized catheter should, if possible, be passed into the bladder, and there retained. If, however, a large catheter cannot be introduced, or should there be reason to suppose that urine has be-

come extravasated, a free external incision should be made in the mesial line of the perineum, so as to give exit to the extravasated blood and urine. A catheter should then be passed along the natural passage into the bladder, where it should be retained until the external wound is healed. This is the practice that was recommended by Mr. Liston, and the only efficient one as regards the safety of the patient. The introduction of a staff as far as the seat of injury, previous to the perineal incision, will serve as a guide to the knife. If extravasation of urine should have occurred when the patient is first seen by the surgeon, in addition to the perineal opening, free incisions should be made in all the parts into which the urine has penetrated.

In the late Mr. Liston's work on "Operative Surgery," the following passage occurs:—"After complete division of the urethra, the anterior part has sometimes, through carelessness or inattention (the patient is generally more to blame than the practitioner), been permitted to close, and the urine has thus continued to be discharged entirely through a false passage. I have more than once had occasion to remedy such an inconvenient state of a patient, by cutting down in the perineum upon the canal, and carrying a catheter onwards from the orifice into the bladder. The instrument is passed down to the obstructed part, an incision is carried from over its point, directly in the line of the raphe, and through the track of the fistula; the urethra is thus opened, and the catheter passed without difficulty."

I shall conclude this subject by the following valuable remarks by Sir B. Brodie:—"In all cases, in which there is reason to believe that the urethra has been divided or lacerated, in consequence of an injury in-

flicted on the perineum, it is the duty of the surgeon, not only to look at the great and immediate danger, but to guard against future ill consequences; and much may be done, in the first instance, towards preventing mischief from which it would be very difficult to relieve the patient afterwards. If there be a penetrating wound, in which the urethra is probably implicated, an elastic gum catheter should be introduced with the least possible delay, and allowed to remain in the bladder until the healing of the wound is far advanced, or, at all events, until it has been ascertained that the urethra has not suffered; the catheter being, however, occasionally removed for a limited time, if it seems to act as a cause of irritation.

“In cases of contusion of the perineum, without an external wound, when an effusion of blood in the perineum or scrotum, or any other circumstances, lead to the suspicion that the urethra has been injured, the same treatment should be had recourse to. The gum catheter should be introduced as soon as possible, and allowed to remain for at least some days after the occurrence of the accident. The extravasation of blood does not in itself justify the making an incision in the perineum; and, indeed, according to my experience, there can be no worse practice than that of making an incision in a case of simple ecchymosis, either under those, or under any other circumstances. But, as where such extravasation exists, there is always reason to apprehend that there may be further mischief, the progress of the case should be carefully watched, and on the first appearance of any symptoms indicating that urine has escaped into the cellular membrane, or that abscess is forming, a staff should be introduced into the urethra instead of the gum catheter, and a free incision

should be made from the perineum into it, the gum catheter being replaced afterwards."

STRICTURE FROM ULCERATION OF THE EXTERNAL URETHRAL ORIFICE.—When the urethral orifice is contracted from the cicatrization of an ulcer, relief may be obtained by the regular introduction of a short bougie or silver tube, which, in some cases, is necessary every time micturition is required. In instances where the whole orifice of the glans has been destroyed by ulceration, there is such a tendency to continued contraction in the cicatrix, that, if neglected, complete retention of urine may occur, and the only effectual means for its relief is division by the knife of the contracted part. In such a case a gum catheter should be kept in the bladder until the wound has healed. Experience, however, proves that even after this operation, the cicatrix still retains its contractile tendency, and to prevent a return of the contraction Sir B. Brodie advises that "a bougie, about two inches long, should be introduced into the urethra every morning, and allowed to remain there for five or ten minutes."

COMPLICATIONS OF STRICTURE,

EITHER

ACCIDENTAL, THE RESULT OF THE
DISEASE ITSELF, OR OF THE TREATMENT
EMPLOYED FOR ITS RELIEF.

COMPTON'S OF STRIOTURE

ACKNOWLEDGMENT OF THE

RECEIPT OF THE TRAVELER

RECEIVED FOR THE TRAVELER

CHAPTER XIII.

RETENTION OF URINE.

OF all these complications this is certainly one of the most important. There are probably few conditions of more intense suffering than that arising from an over-distended bladder, with complete inability to discharge its contents. It is a state truly pitiable, and no words can adequately express the mental and bodily agony often endured under such circumstances. There is scarcely any situation in which more urgent and affecting appeals for immediate relief are addressed to the surgeon, who has the satisfaction of knowing that, however great may be the sufferings of his patient, the resources of surgical art will very rarely fail in affording the desired relief. That art, however, to be successful, must be used with great care and gentleness in the employment of instrumental aid. In surgical works we are often recommended to have recourse to the use of the warm bath and other antispasmodic remedies. This is all very well in theory; but urged by the most pressing appeals for instant relief, and witnessing the extreme sufferings of the patient, no surgeon, I imagine, with a catheter at his command, would, for a single

moment, hesitate to attempt at once to relieve the sufferer from his agony, instead of proceeding, *secundum artem*, by slower and less effective measures. Under whatever circumstances retention of urine may occur, it appears to me, that every other means of relief, being more slow in their operation, should be made subordinate to the introduction of the catheter. The first effort of the surgeon, then, should be to get a catheter into the bladder, taking especial care to avoid lacerating the lining membrane of the urethra, as it would very probably prevent his success, by increasing the spasm of the stricture, besides clogging the eyes of the instrument with blood. The history of the case may afford some clue to the size of the instrument to be employed. If the urine has been passed without difficulty, and in a tolerable stream until the attack of retention, a catheter of medium size may be selected. If, on the contrary, as is commonly the case, the urine, for some length of time should have been voided with difficulty in a fine stream or by drops, then, of course, the only chance of success will be with a very small instrument. The first trial should be made with an elastic gum-catheter, without its stilet, taking care to keep the urethra upon the stretch until the instrument has entered the stricture; but if it cannot be made to pass, the catheter should then be tried with its stilet. If these attempts fail, which, should the retention be caused by a hard, very narrow stricture, is extremely probable, the surgeon may very likely prove successful with a small silver catheter. It must be used with gentleness, but also with perseverance, as it will often be necessary to continue for some little time, steadily pressing the instrument against the stricture, keeping its point to the upper part of the urethra, before it will

be found to enter the obstruction, when by a little continuance of the pressure, it may eventually pass on into the bladder, where it should be retained, as a general rule, not less than twenty-four hours. If the catheter cannot be passed, an attempt should be made with a No. 1 or 2 catgut bougie to penetrate the stricture. If the point of the instrument can be made to enter the obstruction, it should be allowed to remain for a few minutes, and withdrawn during the patient's efforts to make water, when very often the urine will follow in a very small stream, only a small quantity passing at a time; indeed, it will sometimes require several introductions of the instrument before the bladder can be emptied. This is almost the only case in which I use the catgut bougie, which should be well rounded at its point, and very gently managed to avoid tearing the urethra. If the catgut bougie fail, one of plaster should be tried, always bearing in mind the necessity of varying the point of the instrument, and keeping it well to the upper part of the urethra, otherwise it will be apt to catch against the lower portion of the stricture. If still unsuccessful, and there be no objection to the employment of chloroform, it should be administered, as it is not improbable that under its influence a small catheter may be got into the bladder. Success has sometimes been obtained in the introduction of a catheter, after previous failures, by keeping the patient for some time in a hot bath, the instrument having been passed during his immersion. If it be found impossible to relieve the patient by the introduction of instruments, what is then to be done? I can strongly recommend, from long experience of its good effects on such occasions, the employment of potassa fusa. The armed bougie should be pressed gently against the

stricture for a minute or two, so as to give time for the dissolution of the lard which covers its point, and for the efficient action of the caustic. Amongst the cases will be seen instances in which the potassa fusa was used successfully for the relief of retention of urine. I employ the caustic potash in preference to the nitrate of silver, for reasons which have been previously stated. The bowels should be well emptied by an enema, made with two ounces of Epsom salts and an ounce of castor-oil, in a pint and a half of warm gruel; and after its operation, from fifty to sixty drops of laudanum in less than a quarter of a pint of thin starch, should be injected into the rectum. Five grains of Dover's powder, with ten of sesquicarbonate of soda, should be given every second or third hour; and, in urgent cases, as often as every hour, until the patient is well under the influence of opium. If the bowels have not been fully relieved, four or five grains of jalap can be added to the powders. After the use of the injection, a dozen leeches should be applied to the perineum, and the bleeding promoted by a succession of warm-bread poultices. Some surgeons, however, prefer cupping the perineum. I have myself a preference for the application of leeches, as it appears to me that the oozing of blood, which usually continues for some length of time after their removal, has frequently a very good effect as an antispasmodic. The warm hip-bath is often useful in cases of retention; it is also grateful to the feelings of the patient. It is scarcely necessary to caution the practitioner, that his first duty, in all cases of retention, is to examine the perineum carefully, to ascertain if there be any swelling or hardness, as the pressure of an abscess may probably be the cause of obstruction to the flow of urine. The abscess may be situated behind the deep

perineal fascia, and not to be felt very distinctly. If, however, any hardness can be detected by the finger, a free opening should be made with a bistoury, as in the event of there being no abscess, the incision will do no harm, and if there be one, the evacuation of its contents may render other measures unnecessary.

When the treatment just recommended has been carried into effect, and the patient is fairly under the influence of opium, most probably some drops of urine will be passed, more soon following; until, at length, it flows, for a few seconds, in a fine stream, the straining of the patient, and the spasmodic actions of his bladder, gradually subsiding as the water escapes. By keeping up the influence of opium, by the assiduous use of warm fomentations to the perineum, or the employment of the hot bath, more complete relaxation of the stricture generally ensues, and the patient has at length the extreme gratification of entirely emptying his bladder. If the means hitherto described should fail in producing a satisfactory evacuation of the contents of the bladder, for the discharge of two or three ounces of urine must not be considered sufficient, as the kidneys will then, most probably, secrete more than has been voided, it will be necessary that something further should be done for the patient's relief. Continued retention of urine, if no relief can be obtained, must eventually prove fatal, the ureters and kidneys becoming so distended that no further secretion of that fluid can take place, the sufferer gradually sinking under low typhoid symptoms; his position, indeed, at last, exactly resembling that in which there is an entire suppression of the urinary secretion. The rupture of the urethra behind the stricture is, however, to be feared, which misfortune it must be the surgeon's especial care, if possible, to prevent. The all-

important question is, How long will employment of the measures previously recommended be justifiable before adopting a more certain means of relieving the bladder? Are there no signs by which the degree of distension of the bladder can be ascertained? The pathology of stricture unfortunately answers that question in the negative, as the common effect of long continued urethral obstruction, is to cause so much thickening of the walls of the bladder and contraction of its cavity, that when distended to the utmost, it is scarcely to be felt above the pubes. The urgency of the symptoms, and the time which has elapsed since urine had been passed in any satisfactory quantity, are indeed the only guides on which dependence should be placed. Taking into consideration the usual unhealthy state of the mucous membrane behind the stricture, as well as the forcing of the urine against it by the powerful spasmodic action of the bladder, assisted by strong contractions of the abdominal muscles, if only a few drops of urine have been passed, we shall, I think, scarcely be justified in allowing an interval much beyond two days to elapse without having recourse to the operation of either puncturing the bladder, or of opening the urethra. It is right, however, here to state, that although, in general, the bladder will be found thickened and contracted, in cases of retention from stricture of long standing, there are instances in which the vesical cavity becomes much enlarged. In a case lately under my care, I drew off, at one time, no less than sixty ounces of urine.

The circumstances requiring, and the mode of performing, the operations for the relief of retention of urine, are described in the chapter upon that subject. The immediate cause of retention has sometimes been

a small calculus plugging up the urethral canal behind the stricture.

Retention may originate from coagulated blood in the bladder arising from various causes. It may result from regurgitation of blood from the urethra when hæmorrhage has been caused by injury of that canal by the too forcible introduction of instruments. This kind of retention may occur from disease or injury of the bladder itself; or the source of hæmorrhage may be either in the ureters, or in the kidneys. For the treatment of this kind of retention, see "HÆMORRHAGE FROM THE URETHRA." Retention may be caused by inflammation of the urethra, most frequently the result of gonorrhœa, the treatment of which is described in the chapter on "INFLAMMATORY STRICTURE." In cases of stricture complicated with cystorrhœa, retention has sometimes been caused by the contracted passage having become so completely blocked up by thick viscid mucus, that the introduction of the catheter has been required for its removal.

It may be as well here to state, that retention of urine may, of course, result from many causes quite unconnected with stricture, the most frequent of which are, probably, enlarged prostate and paralysis of the muscular coat of the bladder. A person may be so situated, that from motives of delicacy, or other circumstances, he refrains from, or is prevented, emptying his bladder at the proper time, consequently, it becomes so much distended as to lose, for some time, its power of contraction, the excessive distension of the organ causing a temporary paralysis of its muscular coat, and, very probably, requiring for several days the introduction of the catheter. Retention may ensue from temporary paralysis of the bladder, caused by a shock upon the

constitution from operations, or from serious accidents. The retention which so frequently results from the ligaturing of hæmorrhoidal tumours is, I believe, most frequently caused by spasm of the urethral muscles, arising from the sympathy of contiguous parts. Sometimes, however, from the powerful shock of the operation upon the kidneys, their functions become for a time suspended, when suppression, instead of retention, of urine ensues. To the above causes of urinary retention must be added paralysis of the bladder induced by various structural lesions of the brain and spinal marrow. Disordered function of those organs may also cause retention of the contents of the urinary bladder. A familiar example of this kind of retention is that which sometimes occurs in cases of hysteria.

Retention may be induced from closure of the preputial orifice, the result of inflammation. Not very long ago I was called to a little boy with this kind of retention, caused by a severe scald, when the obstruction was so complete, as not to admit the introduction of the smallest catheter, and I was obliged to divide the prepuce for his relief.

Whatever may be the cause of retention of urine, unless relief be afforded to those who unfortunately suffer from it, they usually die within a week from the commencement of the attack, with symptoms of a low typhoid character, as has been previously stated. The immediate cause of death may be urinary extravasation, either from the urethra, or, possibly, from the bladder itself; and in some cases, the fatal event may result from gangrenous inflammation of the lining membrane of the vesical cavity.

The preceding remarks should be regarded merely as slight hints for the treatment of retention of urine,

as the selection of the means of relief best adapted to each case will vary according to circumstances, and must, therefore, entirely depend upon the judgment of the surgeon. I hope, however, that the subjoined cases may prove a useful addition to the preceding observations, and supply, in some degree, their many deficiencies.

CASE LIII.—*Retention of Urine from Impermeable Stricture.*

James Golding, aged 65, applied to me, March 12th, 1834, with retention of urine from stricture, which disease, from his account, had been of thirty years' duration. On his application to me, he had been unable to pass any urine for nearly two days, and had, during many months, suffered great pain when making water, which came away by drops, seldom more than a tea-spoonful or two at a time in the day, whilst in the night it was constantly dribbling away. On examination, an impervious stricture was found about an inch from the orifice of the urethra, to which the potassa fusa was applied. A few hours after its application, a small quantity of urine was passed by drops, and during the night a considerable quantity dribbled away. The potassa fusa was used every day; after the sixth application, a No. 3 bougie passed through the first stricture, but was stopped at $6\frac{1}{2}$ inches by a second obstruction, to which the potassa fusa was also daily applied. After the seventh application, a No. 2 elastic gum catheter entered the bladder. In two months the strictures were sufficiently dilated to admit the introduction of a No. 7 steel sound into the bladder. As the man made water very freely, he would not permit my further

attendance, but promised to pass for himself a No. 7 bougie once a week, and to let me know if at any time he experienced a return of the difficulty in making water.

CASE LIV.—*Retention of Urine, with Impermeable Stricture.*

I was requested to visit Mr. S. B., aged 49. This gentleman had been unable to pass his urine for more than twenty-four hours, and the desire to empty his bladder was so urgent, that he was incessantly straining. The patient informed me that he had had a stricture for twenty years, and that his urine had for a long time been passed with great difficulty, accompanied by much straining. On examination, a stricture, impenetrable by the finest-pointed bougie, was found at the bulb, to which the potassa fusa was applied. A full dose of opium was ordered to be taken, and twelve leeches to be applied to the perineum. The patient passed a tolerably tranquil night, and early in the morning the urine flowed in a very small stream. The potassa fusa was used daily from the 1st to the 10th, each application affording marked relief; and on the 11th, a No. 2 silver catheter was passed into the bladder. The stricture was sufficiently dilated by the 20th, to admit the introduction of a No. 7 steel sound, when his urine was passed better than it had been for years. This gentleman, who resided in the country, was obliged to leave town, but promised me that he would apply to his own surgeon to dilate the stricture further. I heard from him a few months afterwards, when he informed me that he passed his urine in a full stream.

CASE LV.—*Retention, with Impassable Stricture.*

Mr. G. B., aged 65, called upon me on the evening of July 24th, 1837, having been unable to pass any urine for fourteen hours. He had had stricture for thirty years ; but during the last ten the difficulty in voiding his urine had considerably increased. The patient said that it sometimes occupied him nearly half an hour to empty his bladder, the urine usually passing by drops, or in a very minute stream, which stopped frequently during micturition. On examining the urethra, a stricture was discovered at $4\frac{1}{2}$ inches, impermeable to the smallest instrument. After the application of the potassa fusa, a dose of castor oil was ordered to be taken, and twelve leeches to be put on the perineum. A few drops of urine dribbled away during the night, and in the morning about a quarter of a pint was passed without much straining. The potassa fusa was used every day, the urine having been passed better after each application ; and when it had been applied six times, the gentleman assured me that he made water better than he had done for years. After the seventh application of the potassa fusa, a No. 2 bougie was passed through the first stricture, but stopped at a second, $2\frac{1}{2}$ inches further, to which the potash was also applied. After three applications to the second stricture, a No. 2 gum elastic catheter, with its stilet, was passed into the bladder, but could not be borne more than four or five minutes. The case presented no further difficulty, the strictures having been gradually dilated, so as to admit the introduction of a No. 8 bougie by the 15th of September. The gentleman considered my longer attendance unnecessary, as he made water very well ; but promised to pass the bougie for himself occa-

sionally. I saw him a few days ago, when he assured me that he regularly passes for himself a No. 8 bougie once a month without any difficulty.

He died from cholera in 1849, never having, since my attendance, experienced any difficulty in passing his urine.

CASE LVI.—*Retention of Urine, with Impassable Stricture.*

May 7, 1839, I was requested to visit Mr. C. A., who had been unable to pass more than a tea-spoonful or two of urine for thirty-six hours. He had for many years experienced more or less difficulty in making water, which difficulty had latterly considerably increased. He attributed his complaint to a gonorrhœa contracted twenty years ago. Has had several attacks of retention of urine, but none so severe as the present. On examining the urethra, I found an obstruction at six inches, into which neither the smallest sized bougie nor catheter could be made to enter. Five grains of Dover's powder, six of rhubarb, with ten of carbonate of soda, were ordered to be taken every second hour; twelve leeches to be applied to the perineum, and afterwards warm fomentations and poultices. On my visit in the evening, but little improvement had taken place, only three or four tea-spoonsful of urine having been passed with urgent straining. A bougie, armed with potassa fusa, was gently pressed against the stricture for about two minutes, and immediately after it had been withdrawn, the urine came in a small but continued stream. May 8th, eight o'clock A. M.—My patient had made water two or three times during the night, in a very small stream, with but little straining. The stricture, however,

still continued impassable to the smallest sized bougie; I therefore again applied the potassa fusa. On the 9th, the urine came away rather better; the application of the potassa fusa was repeated. On the 10th, after unsuccessful attempts to get a small bougie or gum catheter into the stricture, I again had recourse to the potassa fusa, when, after a little gentle pressure, the armed bougie passed through the first obstruction, and met with a second an inch further. The bougie was, of course, immediately withdrawn, and on the 11th the potassa fusa was applied to the second stricture. The next day, a No. 2 elastic gum catheter was passed into the bladder. No further application of the potassa fusa was necessary, the strictures having been gradually dilated so as to admit, by the 6th of September, the introduction of a No. 8 bougie. This gentleman has since called upon me occasionally, when the same sized bougie has been passed with tolerable facility; but I cannot persuade him to attend regularly enough to have his strictures more dilated.

CASE LVII.—*Retention of Urine from Stricture, with Enlarged Prostate, &c. Dilatation by the retention of the catheter.*

On the night of April 2nd, 1846, I was requested to visit Charles Thompson, a dispensary patient, by trade a brazier, who was suffering acutely, having passed no urine for twenty-four hours. He had long been troubled with some difficulty in passing his water. On examination, a stricture was found at $4\frac{1}{2}$ inches, into which, after a few minutes' continued pressure, I succeeded in getting the point of a No. 2 silver catheter. I had made previous unsuccessful attempts with plaster and

catgut bougies. Although the catheter was pressed forward for about ten minutes, it did not advance more than a quarter of an inch into the stricture, which felt very hard. A few drops of urine came away when the catheter was withdrawn. The usual antispasmodic remedies, such as leeches to the perineum, the warm-bath, opium, purgatives, &c., were employed.

April 3rd, 9, A. M.—About a wine-glassful of urine had been passed by drops during the night, and the more urgent symptoms were much relieved. I now fixed the No. 2 catheter in the stricture, and, on my visit in the evening, was informed that there had been a more or less constant dribbling of urine through, or by the side of the instrument, which had been left unplugged. The catheter could now be passed to five inches, and was fixed in that position.

April 4th, 9, A. M.—The catheter had advanced a little, but was withdrawn at the patient's urgent request; it was, however, again refixed in the evening.

April 5th.—The catheter had advanced to $5\frac{1}{2}$ inches, but was withdrawn, as it now caused considerable pain and irritation. As this man had been a free spirit drinker, his general health having become much impaired, and his urine highly albuminous, I thought it best to leave the urethra quiet for some length of time. The prostate was felt through the rectum to be enlarged.

April 26th.—Since the last report, the urine has been passed during the day by occasional straining efforts; about a wine-glassful coming away at a time by drops, or in a very fine stream. During the night it has gradually dribbled away into a tin bottle, contrived by the patient, and secured in a convenient position before going to sleep. I now again fixed in the urethra the No. 2 catheter, which advanced to $5\frac{1}{2}$ inches, as before.

April 27th, 9 A. M.—The man had withdrawn the catheter after it had been retained five hours. After some little perseverance this morning, I succeeded in passing the No. 2 catheter into the bladder, where it was fixed. The greater part of the urethra, from the commencement of the strictured portion to the bladder, felt hard and rugged. At 8, P. M., I found the man had again withdrawn the catheter an hour before my visit, having immediately afterwards voided, in a continued stream, about half a pint of bloody urine. He said that he had not passed his water so well for a great many years. The size of the catheter was gradually increased, by fixing occasionally a larger instrument in the stricture, and retaining it from three to six hours at a time. On the 4th of May I could pass a No. 7 into the bladder, which appeared in a great degree to have lost its contractile power. The urine passes best when the man lies down. As he is now obliged to go to work, I have advised him to pass the catheter morning and evening, so as completely to empty the bladder, which he accomplishes best in the recumbent position.

On the 24th of June, the bladder had very much recovered its power, and the catheter is now very easily introduced by the patient. I advised him to continue the introduction of the instrument, for some length of time, regularly morning and evening. I now lost sight of Thompson, but have since learned that he did not live many months, having died from an attack of low fever. In this case it was necessary to use a silver catheter, for the purpose of dilatation, as from the hardness and irregularity of the stricture, I could never pass one of elastic gum.

CASE LVIII.—*Irritable Stricture, with Retention of Urine.*

May 1st, 1848, I was requested by a medical friend to visit E. C., about 35 years of age, who had long suffered from occasional attacks of retention of urine, caused by stricture of several years' duration. He was in great pain from having been unable to pass any water for many hours. I found that frequent attempts, attended by rather free bleeding, had been made to get an instrument through the stricture. After considerable perseverance, and being obliged to use the greatest gentleness on account of very moderate pressure causing some bleeding, I at length succeeded in passing a No. 2 elastic gum catheter into the bladder, which was fixed in its position. About a pint and a half of high-coloured urine was drawn off. The catheter was retained five days, and then replaced by a No. 4. The irritation from retention of the catheter, however, soon became so great, that I was obliged to withdraw it, and leave the remaining dilatation to be effected by the bougie.

On the 26th, a No. 6 bougie was easily passed into the bladder, when the man was compelled to go into the country, but promised to continue the treatment until a full-sized instrument could be introduced.

This case is related as one of common occurrence, in which it is impossible long to continue the dilatation of a stricture by retention of the catheter. In this instance, however, the object of its retention had been attained by opening a more free passage for the urine; and it was as well, if not better, to effect the remaining dilatation by the bougie, for reasons previously stated in

the chapter on the treatment of strictures by retention of the catheter.

CASE LIX.—*Retention of Urine.—Puncture of the Bladder.*

September 21st, 1848, 6, P.M.—I was requested by a medical friend to see a patient of his, 70 years of age, with retention of urine, whom he had endeavoured unsuccessfully to relieve by the introduction of the catheter. The man informed me that he had passed only a few drops of urine during the last three days. The bladder was felt distended above the pubes. There was a stricture commencing at the bulb, into which I could not succeed in getting an instrument of any kind. From the previous attempts which had been made to pass the catheter, very slight pressure against the obstruction caused some bleeding. On examination per rectum, the prostate appeared to be enlarged. A few months before his present illness, the patient had experienced an attack of congestion of the brain, which caused for some time afterwards great weakness in his lower extremities. It was ascertained that in this case symptoms of stricture had been present forty years, and that for a very long time the urine had been passed in drops, or a thready stream, with great straining; but no attention, it seemed, had latterly been paid to this complaint. Being desirous to avoid puncturing the bladder, I fixed in the urethra a small catheter, with the hope that by gentle and continued pressure, the point of the instrument might possibly enter the stricture. The man had been kept under the influence of opium for some time previous to my seeing him. On my visit the following morning, finding that no relief

had been obtained, and the symptoms of retention becoming more urgent, I resolved at once to puncture the bladder above the pubes, selecting that situation in preference to others, for the following reasons: 1st. The bladder had risen considerably above the pubes, and could not be felt through the rectum. 2ndly. The long standing disease of the urethra, and the inability of the patient to bear the more formidable operation of division of the stricture in the perineum. 3rdly. Enlargement of the prostate. To avoid extravasation of urine I made a free external opening through the skin and linea alba, nearly three inches in extent, from the symphysis pubis upwards; then, separating with my finger the pyramidal muscles, the distended bladder was readily felt. The curved rectum trocar was introduced, and two pints and three quarters of urine of the colour of coffee-grounds were drawn off. The canula was, of course, left fixed in the bladder.

September 28th.—A few drops of urine only have passed by the natural passage since the operation, the urethra having been left undisturbed to the present time. The wound looks healthy, and the man in all respects is doing well. I was able to-day to pass through the urethra into the bladder, a No. 3 elastic-gum catheter, which was fixed there. The catheter was left unplugged, with a bladder attached to it. As this man was not under my immediate care, I did not see him again until October 26th. It then appeared that the catheter had not been retained for more than two days, the patient having withdrawn it himself, and it had not been again introduced for him. Not succeeding in passing the catheter again into the bladder, I fixed in the urethra a No. 5 elastic gum-bougie, so as to press gently against the stricture.

29th. 7, P.M.—The bougie has been kept in, and a considerable quantity of urine has passed by the urethra. The instrument, which had advanced about one-eighth of an inch, was again securely fixed.

My next visit was on Nov. 12th, when it appeared that the bougie had again been withdrawn by the patient in consequence of the irritation which it produced. I had no difficulty in passing a No. 5 elastic gum catheter, which was left fixed as before.

November 21st.—The catheter last introduced had only been kept in for one night, but the greater part of the urine is now passed by the natural passage. The canula had been withdrawn. I passed a No. 6 plaster bougie into the bladder, and recommended that the size should be gradually increased. I did not afterwards see this patient, but was informed that he died rather suddenly from an attack of apoplexy on the 30th of November. The wound made in the operation had nearly healed.

CASE LXI.—*Retention of Urine from Stricture, with False Passages.*

Mr. W., aged 36, admitted a dispensary patient, January 27th, 1837, being in great pain from retention of urine. Has had more or less difficulty in passing his water since the age of fourteen, in consequence of a severe blow upon the perineum, from having fallen astride against a piece of timber; and for several years past micturition had been attended with great straining. No instrument had been passed into the bladder for the last eight years, although frequent attempts to effect that object had been made by different surgeons, the patient having been for several weeks in an hospital.

* These attempts had been usually followed by rigors and severe constitutional disturbance, some of them having been attended with rather profuse bleeding. The patient said that, although no surgeon had been able to get an instrument into his bladder, he had himself occasionally succeeded in passing a No. 8 elastic gum bougie as far as ten inches, but, to his surprise, without any improvement in voiding his urine. I ascertained subsequently that there existed in this case two false passages, one running a short way on the right side of the urethra, and the other a considerable distance between the neck of the bladder and rectum. There was much thickening externally along the bulbous, membranous, and prostatic portions of the urethra. When I first saw the patient he had passed no urine for the last twelve hours, and the spasmodic contractions of the bladder were exceedingly painful. He had taken a full dose of opium before my visit, and he was ordered to take another directly. With a No. 3 silver catheter, keeping its point well to the upper part of the urethra, I succeeded in avoiding the false passages, and fixing its point in the stricture. After having continued steadily but gently pressing the instrument forward for twenty minutes, and the desire of micturition becoming extremely urgent, I withdrew the catheter, when the urine followed in a very fine interrupted stream, a sufficient quantity having escaped to afford considerable relief. The catheter was re-introduced frequently during the next two days, the instrument advancing a little further each time, and always enabling the patient to void his urine afterwards. His bowels had been well emptied, and opium freely administered during the whole period. On the 30th, I used a No. 5 silver catheter, which, after gentle pres-

sure, steadily continued for ten minutes, entered the bladder, in which it was retained during twenty-four hours, when the instrument was withdrawn in consequence of the irritation caused by its retention. This case was afterwards treated principally by the occasional retention of a silver catheter for an hour or two at a time, which was as long as could be borne advantageously, the size of the instrument being gradually increased. At first I found some difficulty in avoiding the false passage on the under side of the urethra, which was exceedingly painful, and always bled whenever the point of the catheter entered it. A No. 10 sound now enters the bladder with facility, and the greater part of the external urethral thickening has disappeared. During the early period of the treatment, the patient was much harassed by spermatorrhœa, having had frequently three emissions during the night, and one or two in the day, when he slept for an hour or two.

CASE LXI.—*Irritable Stricture, with Retention of Urine.*

Mr. M., aged 52, residing at Islington, came to me at nine o'clock on the morning of August 23rd, 1852, having been unable to pass any urine since the previous evening. Had long been a great sufferer from stricture, for the relief of which he had been for several years in the habit of occasionally introducing for himself a small bougie. Attributes his present attack of retention to having taken a glass of brandy and water. He had not for a long time previously ventured to take any spirits. I endeavoured to introduce a No. 2 elastic catheter, first without, and afterwards with, its stilet,

but unsuccessfully, as they only just entered a stricture at $5\frac{1}{4}$ inches. A small silver catheter was tried with no better effect, as were also plaster bougies, the smallest size of which did not go further than a little beyond the entrance of the contraction. A No. 2 cat-gut bougie was then introduced and left in the stricture for a quarter of an hour, but when withdrawn no urine followed, although the spasmodic contractions of the bladder were very urgent. All these attempts having failed, a small piece of potassa fusa was inserted in the end of a No. 3 bougie, passed down to the obstruction, and kept gently pressing against it for about a minute, when I could feel the spasm yielding, and the instrument soon went through the stricture, which appeared to be three-quarters of an inch long. Having allowed the bougie to remain a sufficient time for the potash to dissolve, it was withdrawn, and the urine immediately followed in a small stream, the patient completely emptying his bladder. The retention in this case would, no doubt, have gradually yielded to the influence of opium and the warm bath ; but, in all probability, the application of the caustic potash, by its powerful antispasmodic effects, saved the patient from many hours of mental and bodily suffering.

CHAPTER XIV.

EXTRAVASATION OF URINE.

THE inflammation usually existing on the vesical side of long-continued obstructions of the urethra may eventually cause ulcerative action, terminating in a complete breach of that canal, producing more or less extensive extravasation of urine into the surrounding cellular tissue. In such cases, the ulceration, I believe, commences almost invariably within the urethra, gradually invading the elastic tissue until the parietes of the canal at the seat of disease become so much weakened as to give way whilst the bladder is forcing the urine against the stricture during micturition.

Urinary extravasation may, however, ensue from ulceration commencing externally to the urethra, and its occurrence is explained in the following manner: inflammatory action not unfrequently affects the tissues external to urethral contractions, when, should ulceration take place, the mischief may extend inwardly, and so effect a breach in the urinary canal, which may possibly be followed by infiltration of urine. In the latter case, however, the cellular tissue external to the urethra will most probably, in the great majority of in-

stances, have become so condensed as to form an effectual barrier to the escape of more than a few drops of urine, the result of which is usually an abscess leaving a fistulous opening communicating with the urethral passage.

Extravasation of urine is always a serious occurrence, as the extravasated fluid, naturally very acrid, is rendered much more so when long retained in the bladder, and consequently proves most destructive to the tissues which it infiltrates, its progress, after a short time, when subcutaneous, being indicated by a slight erysipelatous redness of the skin, soon changing to deep red or purple; and finally, unless free incisions be made, becoming black from mortification, the dead parts possessing a peculiarly characteristic and highly offensive odour. The constitutional disturbance is very great, and if unassisted by surgical art, the patient soon sinks into a low typhoid state, becomes delirious, then completely comatous, and commonly dies within a week from the commencement of the extravasation.

Urinary extravasation usually happens whilst the patient is straining during the act of micturition, when he suddenly becomes relieved, and thinks his urine is being properly passed, but on examination, to his surprise, finds that none is flowing by its natural passage. Swelling of the perineum, scrotum, and penis, more or less quickly supervenes, the tumefaction probably extending to the inguinal regions. Under these circumstances not a moment should be lost in the adoption of prompt measures to relieve the sufferer. The case is most urgent, and good surgery necessary for the salvation of the patient's life. I cannot do better than give my readers the advantage of Sir B. Brodie's advice in such an emergency, and shall therefore quote the follow-

ing passage from his admirable "Lectures on the Diseases of the Urinary Organs:" "I have already mentioned that the effusion of urine is followed by relaxation of the stricture. You will probably now be able to introduce a catgut, or some other bougie (a catgut one is to be preferred) through the stricture into the bladder. If you can do so, it is so much the better. Introduce the bougie; let the patient be held in the position in which you would place him for lithotomy; make an incision in the perineum; feel for the catgut bougie, make an incision on it, and, of course, you make an opening in the urethra. Through this opening, the catgut bougie serving you as a director, introduce a short gum catheter, from the wound in the perineum into the bladder. You will generally find, although the effusion of urine has taken place, that there is still a large quantity of urine left in the bladder. Of course it is drawn off by the catheter, and the bladder is emptied. Allow the catheter to remain in the wound and in the bladder. Then make extensive scarifications or incisions through the skin, wherever the urine has been effused underneath, and let these incisions extend to the sloughs of the cellular membrane. Apply a poultice; let the parts be fomented two or three times daily. After one or two days, you may remove the short gum catheter, which, in the mean time, has kept the bladder empty. Your treatment, in other respects, must depend on the existing symptoms and on his general condition."

In some cases, however, no instrument can be passed into the bladder. Under these circumstances, a free and deep incision should be made in the perineum; the superficial fascia must be well divided, so as to give ample room for the escape of the acrid and often highly putrid urine. The integuments of the scrotum, and wherever the urine has been extravasated, must be

freely incised. Dover's powder, or opium in that form which is likely to agree best with the peculiar constitution of the patient, should be given; and saline medicines are often useful in mitigating the febrile disturbance which always, more or less, prevails in these cases. The bowels should be kept open with enemata. From the shock which the constitution has sustained, the nervous system becomes oppressed, and the muscular powers much prostrated. Strong beef-tea, arrow-root, wine, and occasionally brandy, must be given, according to circumstances, to support the enfeebled powers of life. The sesquicarbonate of ammonia, with camphor, often prove a useful addition to the common saline draught. When the nervous system has become somewhat tranquil, supposing the sufferer to survive the constitutional shock resulting from the extravasation, the disulphate of quina, and other tonics, should be administered; whilst the patient's strength is supported by a nutritious, but easily digestible diet. An elastic gum catheter should be got into the bladder as soon as possible, and retained there for two or three days, when it may probably be advantageously replaced by one of larger size.

The local effects of extravasation of urine are more or less sloughing of the skin and cellular tissue, which that highly acrid fluid rapidly destroys. The local mischief must be treated in accordance with the common principles of surgery. The sloughs, when deep, should be freely incised, and as much as possible of the putrid mass removed at each dressing. As soon as the sloughing process has commenced, a small quantity of solution of chloride of lime will prove a useful addition to the bread poultice in diminishing the fetor of the discharge which always attends so much destruction of tissue.

Extravasation of urine may occur from wounds of the bladder or urethra, resulting accidentally, or from the injurious employment of instruments. Effusion of urine from the latter cause, according to my experience, is by no means of frequent occurrence, although it has occasionally taken place from the incision of strictures within the urethra. False passages made by bougies or sounds, are, I believe, seldom followed by urinary infiltration. It is not often that such instruments are at once thrust through the parietes of the urethra ; but the injury is usually commenced in the mucous membrane. The false passage is then gradually bored through the canal, when the accompanying inflammation has ample time so effectually to consolidate the boundaries of the new channel as to prevent infiltration of urine into the surrounding cellular tissue. It is possible that the abuse of caustic in the treatment of stricture may cause extravasation of urine ; but this must be a very unusual event, as when false passages are made by the misuse of escharotics, this mischief is in general gradually effected. At all events, I have never seen any case in which effusion of urine resulted from the use of caustic.

It sometimes happens that the urethra gives way behind instead of in front of the triangular ligament, when the extravasated urine may cause considerable mischief before much perineal swelling is evident. There will usually, however, be difficulty, or perhaps impossibility of micturition, also a sense of deep-seated pain in the perineum, with, more or less, constitutional shock. Under these circumstances a free and deep incision should be made in the direction of the membranous portion of the urethra, which may prevent much subsequent mischief.

I shall conclude this subject by the following case, which may be useful in filling up any deficiencies in the preceding remarks.

CASE LXII.

Whilst at breakfast on the morning of Tuesday, March 28th, 1851, a medical friend of mine was hastily summoned to the bed-room of a gentleman who had for some length of time resided with him, and not a little startled by the declaration of the patient, "I have not long to live." On examination, however, ample cause for alarm was revealed; the penis, perineum, and scrotum, appearing generally of a deep purple colour, fearfully swollen and disfigured. It was a case of too long neglected extravasation of urine. My friend having failed in all his attempts to get a small catheter into the bladder, requested my assistance at one, P.M. The patient was a gentleman about 65, rather stout, and, until the present attack, in the enjoyment of excellent general health. He had, during many years, experienced some difficulty in passing his urine, and latterly, the difficulty had much increased, micturition having been accompanied, at times, with considerable straining. On the afternoon of Saturday, the 22nd, Mr. D—— first observed a little swelling of the scrotum soon after having voided his urine, which was effected with much difficulty and straining. A little urine was passed by its natural channel on the following morning, Sunday; but none afterwards to the time of my visit. The swelling increased a little during the Sunday and succeeding night. On Monday morning, so little inconvenience was felt that the gentleman went as usual to his office, but returned in the afternoon suffering consider-

able pain; the tumefaction having increased in the scrotum, and extended to the penis, which had become much swollen. During Monday night the distension of the affected parts so much increased, and the pain became so urgent, especially in the left inguinal region, to which the tumefaction had extended, as at length to induce the gentleman to disclose the source of his sufferings that some relief might be obtained.

It is rather singular that this patient, although highly intelligent, well educated, and having long known that he was suffering from stricture of the urethra, should never have resorted to surgical assistance until, as the event unfortunately happened, all aid proved unavailing. On my visit at one o'clock, P.M., the distension was very great, and the pain in the left groin most intense. The constitutional disturbance was inconsiderable, the pulse being 80, of good strength, and the tongue moist, but slightly coated with a white fur. Rigors had occurred but once, early on Sunday morning. It was necessary at once to make a free dependent opening for the escape of the urine, and, if possible, to get a catheter into the bladder. I could not succeed in passing an instrument through the stricture, as a guide to the knife. Having, however, got a No. 2 gum catheter just into the stricture, which was at the bulb, I introduced my finger into the rectum, pushed a sharp pointed bistoury in the direction of the membranous portion of the urethra, and then made a free incision outwards through the perineum, which was very deep from fatty deposit and effused urine. Guided principally by my finger in the rectum, for the gum catheter afforded but slight assistance, I succeeded in opening the membranous portion of the urethra, and passing the catheter into the bladder, where it was

fixed. A small quantity of high coloured urine was drawn off, and the instrument plugged. Free incisions were made in the scrotum, penis, and inguinal region. I did not administer chloroform, fearing it might depress the vital powers of the patient, which it was, of course, most desirable to sustain as much as possible, to give him the best chance of supporting the extensive sloughing that must be expected from the long continued urinary extravasation. 8, P. M.—The tumefaction of the affected parts which had discharged freely was greatly diminished, the scrotum especially being reduced to nearly its natural size. No pain, beyond a little occasional smarting, had been experienced since the operation. The patient had obtained some sleep and was in good spirits. The plug was removed from the catheter, and about three ounces of urine were drawn off. 26th. 9, A. M.—Has had a good night, and is entirely free from pain; pulse 100, soft; tongue moist, but more thickly coated. There is but little swelling of the affected parts. Ordered a saline draught with Dover's powder, every four hours. 27th, 12, noon.—Has had rather a restless night, but no pain; pulse 100, of tolerable strength. The wounds looked healthy, there being yet no appearance of sloughing. The patient was a little desponding. The catheter had escaped from the bladder, and I succeeded, without much difficulty, in the introduction of a No. 7, which was securely fixed. About four ounces of high coloured urine were drawn off. An effervescing draught containing sesquicarbonate of ammonia, of soda, sweet spirits of nitre, and camphor mixture, with fresh lemon juice, was ordered to be taken every fourth hour, also an opiate at bed-time. 28th.—Has had a much better night; the wounds still look healthy; pulse 100, of good

strength ; tongue much the same. Twelve ounces of healthy coloured urine were drawn off at 12 last night, and nearly the same quantity this morning. As the bowels had not acted, a warm aperient draught was ordered to be taken every fourth hour as long as necessary. 29th, 12, noon.—Has had rather a restless night ; pulse 108, soft ; tongue much furred and brown. Bowels have not acted. An aperient draught to be given every four hours as long as required. The catheter escaped from the bladder last night during the patient's restlessness. I re-introduced the No. 7 without difficulty. Some of the incisions, especially the perineal one, had a sloughy aspect, and the lower part of the scrotum was of a dark purple colour. Half-past 7, P. M.—Has had some sleep ; the tongue was brown but moist ; pulse 100, rather weaker. For the first time, a slight disposition to coma was observed. 30th, half-past 10, A. M.—Passed a very restless night ; bowels had acted freely ; the pulse was 112, and a little weaker ; tongue brown and dry. There was a black slough on the lower part of the scrotum extending nearly to the perineal incision.

Sir B. Brodie saw the patient with me at half-past 4, P. M. A free incision was made through the sloughy parts which Sir Benjamin recommended to be kept covered with lint moistened with a lotion composed of half a drachm of terchloride of carbon in a pint of water. The occasional administration of wine and brandy, with as much nourishment as the patient could bear, were also recommended. It may be here stated, that throughout this gentleman's illness, he had been well supported by strong beef-tea, arrowroot, &c., with a liberal allowance of wine and brandy. On my visit late in the evening, there was a great change for the worse in the condition

of the patient, who was evidently fast sinking. He died soon after 5, A. M., on the 31st.

The inefficiency of surgical aid to save this patient from destruction, although much to be deplored, cannot excite surprise, when the length of time is considered which had elapsed from the commencement of the urinary extravasation before assistance was obtained. The urethra had evidently given way on Saturday afternoon; yet the patient went to his office as usual on the Monday, and it was not until the increasing effusion of urine caused so much distension of the skin as to excite urgent pain, that relief was at last sought.

It is to be hoped that the relation of this unfortunate case may prove a useful warning to others affected with stricture, not to neglect to apply in due time for that aid which, if long delayed, may at last arrive when too late. There can be little doubt that had this gentleman obtained proper surgical assistance before, and very probably soon after, the commencement of the extravasation, a valuable life might have been preserved.

CHAPTER XV.

CHRONIC INFLAMMATION OF THE MUCOUS MEMBRANE OF
THE BLADDER.

IN protracted cases of stricture, when the obstruction is considerable, the lining membrane of the bladder is frequently more or less inflamed, the disease being attended with a discharge of mucus; hence its denomination, cystorrhœa, or vesical catarrh.

The mucous membrane of the bladder in persons who die from this disease usually exhibits traces of long continued inflammation, it being much thickened and softened, of a dirty yellow, light brown, or purplish colour, with injected vessels in spots or streaks; sometimes there is ulceration in different portions, and, occasionally, there are gangrenous patches. The interior of the bladder, in some cases, strikingly resembles dark grey marble partially veined with red. When examined with the microscope, the red spots are seen to consist of highly injected vessels with ecchymosed patches. In the gangrenous portions no distinct vessels can be detected; but in others of a dark brown hue, occasional ramifications of a deep purple colour are visible. In protracted cases, inflammation extends along the lining

membrane of the ureters to the pelves of the kidneys and their infundibula, the latter as well as the ureters being frequently dilated. The mischief often extends to the glandular structure of the kidneys, involving those organs in a more or less destructive inflammation.

Cystorrhœa may be of a mild kind, but it is sometimes of a very serious character, occasionally proving fatal. In its more serious form the irritability of bladder is great ; and more or less pain is experienced just before and during micturition, especially towards its termination, the expulsion of the last few drops of urine being, in many cases, accompanied with much spasm and a sense of burning heat along the urethra and in the vesical region. The urine has generally a cloudy appearance, and an adhesive mucous deposit gradually subsides to the bottom of the vessel in which it is placed. The mucus is, I believe, always alkaline, and more or less viscid ; being occasionally streaked with a deposit of phosphate of lime, which is sometimes observed in the bottom of the vessel in mortar-like masses. The mucus may be either transparent, with but little odour ; or, on the contrary, it may be highly fetid, and of a dirty brown appearance ; it is sometimes yellow from the addition of pus, or of a reddish colour, caused by an admixture of blood. The mucus is at times secreted in so large a quantity as to amount to a third part, or possibly as much as one half, of the fluid discharged from the bladder.

When dependent upon stricture, the symptomatic cystorrhœa will subside on removal of the urethral obstruction, unless long continued inflammation should have caused disorganization and irreparable mischief in the lining membrane of the bladder.

The great object, therefore, in the treatment of this affection, when resulting from stricture, is the removal of its cause, for until that be accomplished, it cannot be expected that internal remedies will prove of much advantage. In many of these cases, however, so great is the urethral irritation, especially at the seat of stricture, that the usual means of dilatation cannot be borne, each introduction of an instrument doing more harm than good. Under such circumstances, the use of *potassa fusa* will be found a valuable means of relieving the irritation, a few gentle applications of it to the stricture often enabling the surgeon satisfactorily to accomplish its dilatation. Opium suppositories or enemata should be had recourse to at bed-time as long as they may be required by the continuance of pain and irritation in the urethra or bladder.

The internal remedies which have proved most useful in this disease, are more especially the balsam of *copaiba*, in doses of from five to twenty drops; the decoction of *pareira brava*, so strongly recommended by Sir B. Brodie; the infusions of *buchu* and *uva ursi*. The benzoic acid, in doses of from five to ten grains three times a day, has sometimes been found very beneficial, and is highly recommended in this disease by Dr. Gross. These remedies should be tried in succession, as, when one fails another may succeed; and the combination of some of them will often prove more advantageous than when given separately. A few drops of tincture of *hyoscyamus*, or of opium, may be added to any of the above remedies if required.

Sir B. Brodie recommends the decoction of *pareira brava* to be prepared in the following manner:—"Take half an ounce of the root of the *pareira brava*, add three pints of water; let it simmer gently, near the fire,

until reduced to one pint. The patient is to drink from eight to twelve ounces of this decoction daily. If so large a quantity of liquid should be offensive to the patient's stomach, he may take the extract of *pareira brava* instead, twenty-five or thirty grains being equal to half a pint of the decoction. You may add to it moderate doses of the tincture of *hyoscyamus*; and in those cases in which there is a deposit of the phosphates, you may also add some of the muriatic or nitric acid. With respect to the use of acids, however, in such cases, I may observe that my experience leads me to have much less faith in their efficacy where the alkaline condition of the urine is connected with the secretion of an alkaline mucus from the mucous membrane, than when the urine has been secreted alkaline in the kidneys."

When the triple phosphates, or phosphate of lime, appear in the urine, they generally denote a constitution much impaired, a state of the general health, described by Dr. Prout under the term of "nervous irritability." With regard to the deposition of the phosphate of lime, which is so frequently observed in chronic inflammation of the mucous membrane of the bladder, the same high authority observes:—"In the greater number of instances, however, the deposition is determined by local causes, acting as irritants, or exciting the peculiar chronic degenerating process, in certain tissues, which seems immediately essential to the deposition of the earthy matter. This is, perhaps, the reason why the deposition more commonly takes place in the urinary and sexual organs, than in other parts of the system—these organs being more liable to be abused and to be more frequently inoculated with morbid poisons than all the rest of the body put together. A deposition of

the phosphate of lime may, perhaps, take place in various tissues ; but that form of deposition we are now more especially considering, seems to be generally associated with a tissue common to the skin and to the mucous membranes. Thus the mucous membrane lining the bladder, the cavities of the kidney, prostate, &c., often throw off immense quantities of the phosphate and carbonate of lime ; and from the mucous membrane of the bladder in particular, much of the phosphate of lime usually found in urinary deposits is derived. The remainder is separated by the mucous membrane lining the cavities of the kidneys, or, perhaps, by the kidneys themselves ; the quantity naturally secreted by these organs being apparently liable to be much augmented during the peculiar condition of the system above mentioned."

Should cystorrhœa continue after the removal of the stricture, in addition to the remedies previously recommended, injecting the bladder with tepid water, a practice, I believe, first suggested by Mr. Jesse Foot, will often prove very useful by washing away the viscid mucus which adheres to the vesical lining membrane. Injections should be used only in the more chronic forms of the disease. Sir B. Brodie, who entertains a very favourable opinion of this practice, observes : "In aggravated cases of the disease, where the symptoms are at their greatest height, the mildest injections, even those of tepid water, will do harm rather than good. They are especially to be avoided, where the mucus deposited by the urine is highly tinged with blood."

Injections of nitrate of silver, of nitric acid, and of opium, have all been used with advantage in this disease. The injections should at first be used very weak, and their strength gradually increased. Not more than one or two ounces should be used at first.

Sir B. Brodie, who found the nitric acid injection useful, employs not more than one minim of the concentrated acid to two ounces of distilled water to begin with, and afterwards increases it to double that proportion, allowing it to remain in the bladder only thirty seconds. Sir Benjamin recommends the operation at first to be repeated every second day, and never oftener than once daily.

Before using any of these medicated injections, the bladder should be cleansed by injecting a small quantity of tepid water. My own experience of irrigation of the bladder is highly favourable, not only in this affection, but also in other forms of vesical irritability. In the use of these injections, however, especial care should always be taken to avoid painful distension of the bladder. Counter-irritation in the supra-pubic and perineal regions by setons, emetic-tartar ointment, and other counter-irritants, will sometimes prove an useful addition to the treatment previously recommended.

I may add, in concluding this subject, that chronic inflammation of the lining membrane of the bladder attending aggravated cases of strictured urethra, unless complicated with enlargement of the prostate gland, will generally subside on removal of the urethral obstruction. It is therefore, principally, when this complication exists, and keeps up irritation of the bladder, that the employment of vesical injections will be required.

Acute inflammation of the bladder, I believe, very rarely occurs in consequence of stricture. Should, however, such a complication exist, the acute affection will, of course, require much more active antiphlogistic treatment than the chronic, both general as well as local bleeding being almost indispensable in the former.

CHAPTER XVI.

SACCULATED BLADDER.

THIS affection, commonly denominated hernia of the mucous membrane of the bladder, is the result of obstruction to the free egress of urine. The bladder, in consequence of that obstruction, being excited to increased action, its mucous membrane, at length yielding to the distension of the urine, becomes forced through some of the interstices of the muscular coat of the organ. Mr. Guthrie, who describes sacculation of the bladder as occasionally the result of the bar-like ridge at its neck, considers the arrangement of the vesical transverse and longitudinal muscular fibres favourable to the occurrence of sacculation, as the fibres cross each other at right angles, leaving small intervals occupied only by mucous membrane and cellular tissue. It is through these spaces, unprotected by muscular tissue, that Mr. Guthrie considers the protrusion of the mucous membrane takes place. The protrusion, small at first, may go on increasing until it attains considerable magnitude. The pouches are mostly formed at the sides and posterior part of the bladder; they vary in size, containing from a few drops to several ounces of urine,

and are formed by the mucous and peritoneal coat of the bladder, the former being usually more or less thickened from inflammation, often secreting a purulent fluid, which is mixed with the urine. The vesical opening of these pouches may be so small as scarcely to admit the introduction of a moderate sized quill, or sufficiently large for the introduction of the closed hand. They sometimes contain calculous concretions. The symptoms of sacculated bladder are seldom well marked. Mr. Guthrie mentions as symptoms of this affection a peculiar sensation communicated to the hand by the catheter after expulsion of the last drops of urine, as if a smart blow had been given to the instrument; in some instances, the impulse has been more gentle, described by that surgeon as "the fluttering blows of the bladder," from their resemblance to the blows given by the wings of a bird in fluttering. Mr. Guthrie informs us, that in one instance of this affection "the silver catheter often received so smart a shock that it was forced out a couple of inches." At the examination after death, five pouches and the bar at the neck of the bladder were observed. Mr. Guthrie considers that the blows are caused by the descent of the pouches containing urine, which were brought forcibly against the instrument by the muscular efforts of the bladder in contracting on the evacuation of the last few drops of urine from its cavity.

The pouches being seldom completely emptied, the urine is more or less offensive. In one of Mr. Guthrie's cases the patient complained most that after micturating in the erect position, on resting in bed, he felt as much inclination as before to pass his urine, and that by straining forcibly he could void a small quantity. He obtained relief by first drawing off his urine whilst

standing; and afterwards, by lying down and varying his position from either side to his face, he was enabled to get rid of some more, which relieved him for a time. The best method of affording relief in sacculated bladder, appears to consist in keeping the pouches as well emptied as possible by the judicious introduction of the catheter, whilst at the same time, such other remedies should be employed as are usually found most to allay vesical irritation.

CHAPTER XVII.

IRRITABILITY OF THE BLADDER.

THIS is often a most annoying effect of strictured urethra. In the natural state, under ordinary circumstances, the urine is excreted from four to five, or six times, in the twenty-four hours, the quantity varying from thirty to forty ounces; rest during the night being seldom disturbed for the purpose of micturition. It is far otherwise in aggravated cases of stricture, when such is the irritability of the bladder that there is frequently an irresistible desire to void the urine every hour or oftener, during the day, and perhaps nearly as often in the night. The immediate cause of the irritability in these aggravated cases is, I believe, more or less inflammation or congestion of the lining membrane of the bladder, and the urine then contains a portion of viscid mucus.

In persons of high nervous susceptibility, an irritable state of bladder sometimes occurs in the earlier stages of stricture, when the urethral irritation may not only affect the bladder sympathetically, but also the kidneys, exciting those organs to augmented secretion, thus increasing the number of micturitions, as well as the

quantity of urine voided. The principal attention of the surgeon should, of course, be directed to the stricture, for the vesical excitement commonly decreases as the stricture becomes widened, the irritability of the bladder entirely subsiding on or before the complete removal of the urethral obstruction, unless from long continuance of the disease irremediable organic mischief has occurred in the kidneys or bladder. Upon this subject Dr. Prout observes:—"Another fertile source of irritable bladder, and indeed of a great deal of mischief, not only in that organ and its appendages, but even in the kidneys themselves, is stricture of the urethra. The management of this falls entirely within the province of the surgeon; and as long as the stricture remains nothing can be done towards alleviating the patient's sufferings. The first object of the surgeon, therefore, will be to remove all mechanical obstruction from this organ, and very often when that is accomplished, every symptom will vanish, that is to say, provided the bladder and kidneys have not become organically affected."

Much, however, may be done to assist the mechanical part of the treatment, especially by the introduction into the rectum of opium suppositories at bed-time, consisting of two grains of opium, or ten grains of the soap and opium pill; or of an injection of forty or fifty drops of laudanum in two ounces of thin starch or gruel. Relief will also be afforded by keeping the urine in a healthy state, so that it may be as little irritating as possible. If the urine be too acid, from ten to twenty drops of liquor potassæ, with the same quantity of tincture of hyoscyamus, in an ounce of camphor mixture, should be taken two or three times daily; or, if too alkaline, acids should be prescribed, the nitro-muriatic

is probably the best, to which may be added a few drops of tincture of opium. When the urine is acid, and causes more or less sense of heat during micturition, the addition of ten or twenty drops of the wine of colchicum, may prove a useful addition to the alkaline mixture previously noticed, especially if there be any gouty disposition in the patient. The propriety of attending strictly to the urine in these cases must be evident, as it is well known that an unhealthy condition of that fluid is of itself often sufficient to keep up an irritable state of the bladder; as is sometimes also a disordered state of the stomach and bowels, which indicates the necessity of paying attention to those organs. The diet and general treatment should be antiphlogistic, unless the urine deposits the phosphates freely, when it will be necessary to allow a more generous regimen.

Persons predisposed to gout, when affected with stricture, are peculiarly liable to irritability of the bladder, caused by an acid state of the urine. In such cases the class of remedies usually found most efficient in the removal of that state of the constitution most favourable to the occurrence of gout, should be exhibited, whilst at the same time attention must be paid to the local disease.

CHAPTER XVIII.

SPASM OF THE BLADDER.

THE spasmodic action or painful contractions of the muscular coat of the bladder upon its contents must be familiar to all who are accustomed to the treatment of the more severe forms of urethral obstruction. In highly contracted strictures, where the difficulty of micturition is great, the principal suffering of patients is evidently caused by the frequently recurring spasmodic efforts of the bladder to propel its contents through an extremely narrow rigid channel. That the most painful sufferings arise more from spasm than from mere distension of the bladder, is evident from the periodic occurrence of the severe paroxysms of pain. If it be asked, why the contractions should not be persistent as long as the vesical distension continues, the law of alternate contraction and relaxation, by which muscular action is governed, must be a sufficiently satisfactory answer to the question. This alternation of contraction and relaxation of muscular action also accounts for the inability of a patient with a tight stricture completely to empty his bladder at one micturition. When watching patients who suffer from considerable diffi-

culty of micturition from urethral stricture, it will be observed that the urine is discharged only in small quantities at a time, as if the bladder were unable to continue but for a very short period the powerful contractions requisite for the expulsion of its contents through a highly obstructed channel. The same phenomena of alternate relaxation and contraction are often observed in spasmodic affections of the intestinal canal, arising from obstruction to the passage of its contents in some part of that tube. That distension of the bladder is the cause of the spasm there can be no doubt from the immediate mitigation of suffering obtained by the evacuation of only a small quantity of its contents. The retentive capacity of the bladder is often greatly diminished in cases of long continued urethral obstruction, so much so, that it may probably be incapable of containing more than three or four ounces, or not even that quantity, without the patient feeling an urgent desire of micturition, although in its healthy state, it will usually contain from half a pint to a pint, or even more, and no uneasy sense of distension be experienced. It is evident, therefore, that the severity of the spasms in cases of deficient micturition is no proof that a large quantity of urine is contained in the bladder, but merely that the organ is distended beyond its capacity for retention without inconvenience.

Spasm of the bladder may of course be produced by other causes than stricture of the urethra; the most common of which is the presence of a stone in the vesical cavity. Spasm may also be produced by ulceration, by fungoid tumours, or other organic mischief of the bladder; also by disease of the kidneys, enlarged prostate, irritating diuretics, &c. In this affection there is pain in the region of the bladder, extending,

especially in obstruction of the urethra, along that tube, being often accompanied with very painful erections.

For the temporary relief of spasms of the bladder, dependent upon stricture of its excretory canal, opium is the remedy of most value, and it is often requisite to exhibit that drug in rather large doses, as has been previously noticed in the treatment of retention of urine. Nauseating doses of tartarized antimony may often be usefully combined with opiates in these cases. Next to opium, as a valuable remedial agent in spasm of the bladder, is, I believe, the hot bath. The above remedies, however, can only be regarded as affording temporary relief to the sufferings of the patient, as the only means of entirely preventing the recurrence of the spasms is by widening the obstructed passage upon which they depend. The method by which the latter object can best be accomplished has been previously noticed in the treatment of stricture.

CHAPTER XIX.

STONE IN THE BLADDER.

THIS disease is occasionally associated with stricture, and there is usually but little difficulty in detecting the complication from the greater suffering, and from the peculiar symptom of vesical calculus being added to those of urethral obstruction. If a patient with a constricted urethra should sometimes void bloody urine, especially when there exist other symptoms of stone, it will, of course, be desirable to sound the bladder as soon as possible. If, as the stricture becomes widened, the difficulty and pain in micturition should not gradually subside, and there be no improvement in the stream of urine, the operation of sounding must not be unnecessarily delayed.

In general, however, the symptoms of stone will be so well marked, notwithstanding the existence of stricture, that the complication will be soon detected. The irritation produced by a calculus upon the neck of the bladder is apt, at times, to extend to the membranous portion of the urethra, exciting contraction of its surrounding muscular fibres, causing a spasmodic stricture. This may, probably, lead to the error of mis-

taking a case of stone in the bladder for one of stricture. A few years ago, I was consulted by a gentleman, 27 years of age, residing in the country, who was supposed to be suffering from a strictured urethra, having for more than a year been treated for that disease by two surgeons. I was informed by the patient that for some length of time a No. 11 bougie had been regularly introduced into his bladder, but without any mitigation of the distressing symptoms, from which he still suffered as much as ever. I at once examined him with a No. 11 sound, which was a little grasped at the membranous portion of the urethra, and readily detected a stone, which, after a little preparation of the patient for the proceeding, I crushed with Weiss' screw lithotrite. The calculus was of a tolerable size, requiring eight operations completely to clear the bladder. Nearly two drachms and half of detritus were collected. I heard of this gentleman four years after the operation, when he had no symptoms of either stricture or stone. I think there can be but little doubt that in this case the stricture was merely spasmodic, the result of irritation produced by the calculus.

When the sufferings of stone are added to those of stricture, it is, of course, very desirable to free the patient from the former as soon as possible, and the obstruction should be as rapidly dilated as can with safety be effected. Under these circumstances, as previously observed, I think that Mr. Holt's dilator may be advantageously employed, should the stricture be too contracted to admit the introduction of a tolerable sized sound.

CHAPTER XX.

BAR-LIKE RIDGE, OR CHRONIC THICKENING OF THE NECK
OF THE BLADDER.

THIS affection was first clearly described by Mr. Guthrie, in his work on the "Anatomy and Diseases of the Bladder and Urethra," published in 1834. Mr. Guthrie satisfactorily demonstrated, as previously noticed, "that the elastic structure at the neck of the bladder may be diseased, without any necessary connection with the prostatic gland." The bar-like ridge, which is situated transversely at the inferior portion of the neck of the bladder, consists in more or less thickening of the mucous and cellulo-fibrous tissues of the affected part. In its advanced stage, the ridge is of a firm dense structure, being usually from an inch to two inches in length, and seldom more than three or four lines in length. From its occupying the situation of the third lobe of the prostate, with which it has usually a close connection, there can be little doubt that previous to Mr. Guthrie's observations upon the subject, this disease had been commonly mistaken for an enlargement of that gland. Mr. Guthrie observes that, "In its simple or first stage, when there is only a defect

of elasticity, it gives rise to stricture at the very neck or orifice of the bladder, curable by common means, if properly applied. In the second stage, when the bar is formed, and becomes more or less rigid, a small bougie rests against it, and, if made of soft materials, bends, and cannot be made to proceed; if a solid instrument, it passes in one of the hollows, on each side of the white central line, which are also deepened by the elevation of the uvula vesicæ, catches on the valve at the entrance, and when the handle of the instrument is depressed, it raises the bladder, rectum and all, upon its point, until the pain or resistance induces the surgeon to forego the depression; or the valve yields, or is torn, when it finds its way into the bladder; or perhaps the surgeon, not possessing much experience, is satisfied with the distance the instrument has gone in, and supposes it has passed into the bladder.

“When the disease reaches its third stage, or that which gives rise to considerable difficulty and straining to pass water, and which cannot always be effected, many serious symptoms arise.” Mr. Guthrie describes this disease as usually affecting persons of advanced age, although it sometimes commences at an early period of life; like the chronic enlargement of the prostate gland, it is very insidious in its progress. This affection, from its very gradual occurrence, will generally have advanced to a considerable extent before it is discovered. Its symptoms, according to Mr. Guthrie, are more or less difficulty and increased frequency of micturition. As the disease advances, the desire and difficulty of micturition increase, attended with pain in the vesical region, which is relieved for a short time on passing a little urine, but soon returns, as the bladder is scarcely ever completely emptied. The urine is more or less

vitiated, containing a quantity of ropy mucus, the disease being, in fact, complicated with cystorrhœa, the mischief frequently extending to the kidneys. Mr. Guthrie has also particularly noticed the occurrence of pouches of the urinary bladder as a consequence of this affection. The power of the constitution at length gives way, and the patient gradually sinks, completely worn out by long continued suffering. The diagnosis of this disease is often exceedingly difficult, from its symptoms bearing so striking a resemblance to those of chronic enlargement of the prostate gland, with which it is often associated. As the latter affection, however, is one of advanced life, if with the characteristic symptoms of the bar-like ridge occurring in an early or middle period of life, an obstruction be constantly experienced at the neck of the bladder on the introduction of an instrument, the diagnosis will be much less difficult. Although the symptoms of the bar-like ridge are the same as those of urethral stricture in its advanced stage, yet the situation of the obstruction at the neck of the bladder will sufficiently distinguish it from the latter affection, which has very rarely been observed beyond the membranous portion of the urethra. When similar symptoms arise from vesical calculus, the introduction of the sound will soon elicit the cause of their occurrence. If the symptoms result from general enlargement of the prostate, the true nature of the case will most probably be detected by the introduction of the finger into the rectum ; but should the enlargement be confined to the middle lobe of the gland, forming a projection at the neck of the bladder, I know of no means of distinguishing that affection from the bar-like ridge.

The treatment of this disease must depend greatly upon its complications ; of these, the more distressing,

and chiefly deserving attention, are those of cystorrhœa and sacculated bladder, the management of which is described in their proper places.

With regard to the local treatment of this affection, Mr. Guthrie observes: "When the disease occurs in persons under or about the middle period of life, the steady use of the solid silver sound, gradually increasing the size to the largest the urethra will admit, will gradually effect a cure ; although, to prevent a relapse, it should be passed occasionally." When there is inability to empty the bladder completely, the regular introduction of the catheter will be required. Mr. Guthrie has found great benefit to arise from washing out the bladder every other day with water as hot as can be borne with comfort to the patient. A full-sized silver catheter, when it can be passed, is used by Mr. Guthrie in these cases, and he thinks its occasional retention, if it can be borne without much irritation, likely to prove beneficial by promoting, in some degree, absorption of the bar-like ridge. In cases where, notwithstanding the regular introduction of the catheter and sound, the disease still advances, and the patient's sufferings increase, Mr. Guthrie recommends division of the ridge by an instrument of his invention very similar to the central perforator or lancet of Mr. Stafford. When all the means previously suggested fail, and the patient is becoming exhausted by the severity of his sufferings, Mr. Guthrie thinks that a proceeding similar to the lateral operation for lithotomy might still afford a fair chance of relief. He recommends that the incision "should never extend quite to the boundary, or external wall or covering of the prostate gland. It need not be of a larger size than will admit the finger easily to examine the neck of the bladder, and to ascertain that

the division of it and of the bar have been properly accomplished." Mr. Guthrie adds, that he has not had the opportunity of doing this operation, and that he cannot therefore recommend it as sanctioned by experience, but must be contented to suggest its practicability.

My own observations relating to the bar-like ridge have not been very satisfactory ; for although I have occasionally met with obstructions at the neck of the bladder when no enlargement of the prostate was perceptible on examination by the rectum, yet, as most of them occurred in persons of rather advanced age, I had no means of positively ascertaining whether the symptoms resulted from the bar-like ridge, or from hypertrophy of the middle prostatic lobe. In the general observations at the commencement of this work I have alluded to two cases of obstruction at the vesical orifice, apparently formed by the bar-like ridge, which occurred in persons at the middle period of life.

A brief description of the following case, which I have little doubt was an instance of the disease in question, may prove a useful practical conclusion to the present subject. I was consulted several months ago, by a gentleman about fifty years of age, who had suffered, during many years, from more or less pain and difficulty of micturition, with irritability of bladder. He had been for some length of time under the care of an eminent surgeon, who had succeeded in dilating the obstruction sufficiently to permit the introduction of a No. 10 metallic sound, when he left his professional adviser, and continued regularly passing for himself the same sized instrument until his application to me. At that time he suffered from great irritability of bladder ; so urgent, indeed, was the desire of micturition, that scarcely any rest could be obtained during the night

without having recourse at bed-time, to a strong opiate enema. He suffered much, at times, from pain in the region of the bladder ; and his urine usually contained a considerable quantity of mucus. The urine was passed with much straining, and in a very small interrupted stream. I could pass a full-sized sound as far as eight inches ; but could not succeed in passing a bougie of any size beyond that distance. With some difficulty, I at length succeeded in introducing a No. 7 silver sound into the bladder, which passed with a jerk, apparently over a ridge at the vesical orifice. On a careful examination of the prostate through the rectum, whilst the sound remained in the bladder, I could detect no enlargement of that gland, and therefore concluded, as the disease had existed for many years, that the cause of obstruction was the bar-like ridge. I was convinced, as was the patient himself, that the No. 10 sound, which he had been regularly using, had never entered the bladder, for it always stopped at about eight inches, and never afforded any relief. I gradually increased the size of the sound to No. 10, with very great relief to the patient ; so much so, that the irritability of bladder and cystorrhœa had nearly subsided. On increasing the size of the instrument, however, to No. 11, so much irritation ensued, that most of his previous sufferings returned as bad as ever, and he very naturally becoming dissatisfied, discontinued his attendance upon me. I have since learned from a friend of the patient's, that he consulted two other surgeons, who assured him that he had no stricture, from the circumstance, I presume, of the general non-occurrence of that disease so far back in the urethra. It will be seen that in one of the cases of this disease, to which allusion is made in the general observations, I had recourse to

an occasional application of potassa fusa ; but it was in a very mild form, merely for the purpose of allaying irritation ; and it certainly appeared to me to produce the intended effect, most probably by relieving the inflammation of the affected part.

CHAPTER XXI.

INFLAMMATION OF THE PROSTATE GLAND—PROSTATITIS.

THIS is a much less frequent effect of stricture than might be expected from the proximity of the prostate to the bulbous portion of the urethra, the most common seat of obstruction. Even in aggravated cases of stricture, attended with considerable inflammation of the urethral mucous membrane, extending to its prostatic portion, the gland itself usually escapes without apparently participating in the inflammation, at least such is the result of my experience. The structure of the prostate must surely be unfavourable to the occurrence of inflammation, or that affection would be more common, considering the many probable causes of inflammatory action to which the gland is exposed, such as gonorrhœa, stricture, and the various sexual indulgencies.

As, however, the urethral inflammation attending stricture, especially when the obstruction is at the posterior part of the canal, may sometimes extend to the prostate, causing more or less inflammation of that gland, I shall offer a few brief observations upon its nature and treatment. The pre-disposition to prostatic

inflammation appears to be least in early youth and advanced age; the period when the sexual organs are in their highest vigour being that in which it is most likely to occur. Prostatitis is not a primary affection, being usually, with few exceptions, the result of extension of inflammation from neighbouring parts, or of mechanical injury.

The symptoms of this disease are, increased frequency and difficulty in micturition, with an aching and bearing down pain about the neck of the bladder, the pain extending along the urethra to the perineum and pubes. The desire to void urine is sometimes most urgent, and almost incessant; micturition being attended with an acute sense of scalding, at times so extremely severe as to require no small share of philosophy to bear with patience. Complete retention of urine may occur. Painful sensations are experienced in the rectum, particularly a feeling of weight and bearing down with tenesmus. The pain is increased by whatever causes pressure upon the inflamed part, such as the contractions of the bladder in micturition, expulsion of the fæces, and the sitting posture. The constitutional disturbance is great, evinced by high febrile excitement, the patient sometimes becoming delirious. The above are the signs of acute inflammation of the prostate; when less intense, or what is called sub-acute, they will be milder; and, should the disease occur in scrofulous persons, its progress will probably be so insidious that suppuration may ensue without any well marked indications of the mischief which has occurred. The true nature of the disease can generally be ascertained by the introduction of the finger into the rectum, when the gland will be tender on being pressed and more or less swelling will usually be detected. The enlarge-

ments of the gland may, however, be principally in an upward direction, when, on the introduction of an elastic gum catheter, the point of the instrument will be, more or less, obstructed by the tumefied prostate. Should the feeling of weight and bearing down increase, accompanied by a throbbing pain and occasional rigors, there can then be little doubt that suppuration has taken place in the affected part. It should always be recollected, however, that an abscess of the prostate may occur without any well marked symptoms.

If left to itself prostatic abscess most commonly bursts into the urethra or bladder, where it meets with least resistance. It may, however, burst into the rectum, or open externally, by making its way through the perineal tissues, the latter being the most fortunate locality for the patient.

TREATMENT.—The great object of this should be to prevent suppuration of the inflamed gland, which may be attended with the most serious consequences. The horizontal position must be strictly enforced. Blood should be taken by cupping on the loins, and by the application of leeches to the perineum; and if there be much febrile excitement, and no contra-indication exist, the local must be preceded by general bleeding, so as to produce a decided effect upon the system; the bleeding should be followed by the assiduous applications of hot fomentations to the perineum, pubic, and hypogastric regions.

Immersion in a hot bath until the patient becomes faint, has often produced an excellent effect, especially in the early stage of the disease. An active aperient should be given, and after its action an enema, containing fifty drops of laudanum in two or three ounces of gruel, should be administered. The repetition or not

of the local bleeding must be regulated according to the symptoms. Next to the free abstraction of blood, I believe there are no means more likely to prevent suppuration than the exhibition of small doses of calomel, continued if the symptoms denote the persistence of inflammation, until the gums become slightly affected. This plan is recommended by Sir B. Brodie, and is that which I have commonly adopted. To an adult I have usually given two grains of calomel, with five of Dover's powder, every four hours, with the addition, when the fever has been high, of the sixth of a grain of emetic tartar. The bowels should be kept gently open, but not irritated by the exhibition of drastic medicines. When retention occurs, a small elastic gum catheter, without its stilet, should be regularly introduced, so as to prevent uneasy distension of the bladder, and the consequent forcing of the fluid against the tender prostate.

When suppuration has occurred, the abscess must, if possible, be prevented from bursting internally. As soon, therefore, as the least swelling or hardness can be detected in the perineum, a free opening should at once be made by passing a sharp-pointed bistoury in the direction of the prostate, which can be safely guided by the assistance of the left index finger previously introduced into the rectum. This is the method which I have pursued in cases in which there have been indications of a deep seated urinary abscess, and have never had cause to regret the proceeding; and it is one which will often save the patient much suffering and misery.

The following are the observations of Sir B. Brodie, upon this subject: "When an abscess of this kind has been opened, or has burst in the perineum, it generally happens that a portion of the urine flows through

it, showing that it communicates with the urethra as well as externally. This prevents it from healing, and in order that the inconvenience should be relieved, a full-sized bougie or catheter should be introduced from time to time, under which treatment the healing will soon be completed.

“When a patient labours under such symptoms as would lead you to believe that an abscess has formed in the prostate, communicating with the neck of the bladder, you should direct him not only to be as quiet as possible, but to remain altogether in the horizontal posture. You should instruct him in the use of the gum catheter; and he should introduce it for himself whenever he has the desire to void his urine, so that he may always make water by means of the catheter, and not by his own efforts. In some instances I have caused the gum catheter to be constantly retained in the urethra and bladder until the abscess has healed; but this plan not unfrequently irritates the neck of the bladder; and the occasional introduction of the catheter is, for the most part, to be preferred. In other cases, even this excites irritation, and the catheter must be omitted altogether.”

If no sign of an abscess can be detected in the perineum, the rectum must be examined, and should a fluctuating swelling be felt pressing upon the bowel, an opening must be made in the most depending part of the tumour, by the introduction of a curved trocar, which can be safely guided by the finger.

Another termination of prostatic abscess, not often mentioned by authors upon the subject, is noticed by Professor Gross, who observes: “The abscess may burst into the peritoneal cavity, at the side or posterior part of the prostate, and so cause fatal inflammation. The

occurrence, which is fortunately very rare, is announced by severe pain in the pelvic region, a small, quick, and contracted pulse, violent rigors, and rapid prostration of the vital powers. Death usually occurs in from thirty-six to forty-eight hours."

During the inflammatory stage of prostatitis, the antiphlogistic treatment should be adopted; but when abscess has occurred, and the matter been discharged, the patient's strength must then be supported by a nutritious diet, also by the administration of quinine and other tonics.

CHAPTER XXII.

HYPERTROPHY, OR CHRONIC ENLARGEMENT OF THE
PROSTATE GLAND.

IN this affection, familiarly known as senile hypertrophy, from its rarely occurring except in advanced life, the gland becomes very gradually enlarged, varying in size from a slight increase of its normal proportions to that of a hen's egg or small orange, although in some instances it has attained a much greater magnitude. The hypertrophy usually, but not invariably affects in some degree the entire gland, one of the lobes, however, being more enlarged than another. Sir Everard Home, to whom we are indebted for the most valuable practical information upon this disease, found the left lobe to be the one most frequently enlarged; a fact which, although not confirmed by other pathologists, certainly merits attention, emanating from one whose experience was probably greater than any other writer upon the subject. There appears no very satisfactory reason to account for this greater liability to enlargement of the left than of the right lobe. We may possibly find an explanation of the fact, supposing it to be the case, from the left side of the body being weaker than the right,

which may account for the former being more prone to some particular diseases than the latter.

Enlargement of the middle or third lobe, which was, I believe, first described by Sir Everard, usually offers the most complete obstruction to micturition, forming a tumour projecting into the bladder of merely a small nipple-like process behind the internal urethral orifice, or it may attain the size of a small pear or apple. Although hypertrophy of the middle lobe usually forms the greatest impediment to micturition, yet, in many instances of enlargement of the lateral lobes, the urethra is so completely blocked up as greatly to interfere with, if not entirely to obstruct, the egress of urine from the bladder.

When the prostatic enlargement is considerable, the urethra becomes elongated, usually flattened and tortuous, having its natural curve close to the bladder greatly increased. When the projection is formed by the left lobe, the urethra will be pushed to the right side, and in an opposite direction, should the right be affected. In hypertrophy of the middle lobe the urine escapes from the bladder by two channels, one passing on each side of the tumour. It is necessary to bear in mind these occasional deviations of the normal course of the urethra when introducing the catheter.

The chronic enlargement of the prostate is usually caused by an excess of nutrition—from an increase of the natural elements of the gland. Mr. Adams, the latest author on this subject, observes, that “When examined by the microscope, its blood-vessels will be found numerous and large; its ducts and follicles are immensely increased in diameter; they are loaded with concretions, and there is a remarkable increase in the deposit of the white fibrous and muscular

elements which fill up the spaces between the follicles. Occasionally we find large tumours developed in the lobes analogous to the fibrous tumours which occupy the female breast, and which are constituted of a genuine hypertrophy of the glandular tissue. Sometimes the enlargement depends on the growth of distinct oval and circumscribed tumours growing within the gland."

When the hypertrophy is considerable, the gland is usually more or less indurated, sometimes so much so as to possess the consistence of the fibrous tissue, hence its occasional description as scirrhus prostate. In many instances, however, the enlarged gland has been found much softer than natural. Ulceration in some portion of the affected lobe is of no uncommon occurrence, and greatly adds to the sufferings of the patient.

Hypertrophied prostate, although an occasional, is, I think, by no means so frequent a complication of urethral stricture as has been generally supposed. In but very few comparatively of the instances of senile hypertrophy within my own experience has there been a permanent stricture. If, as asserted by Sir Everard Home and others, that stricture of the urethra greatly tends to the production of hypertrophy of the prostate, the two diseases would surely be found more frequently associated. In elderly persons who have for many years been affected with stricture of the urethra, we find that occasionally hypertrophy of the prostate may be added to the previous disease, but I do not think we have any evidence to prove that the latter has had any influence in the production of the former.

The pains in the rectal, inguinal, and lumbar regions, with the various painful sensations affecting the penis arising from irritation of the pelvic nerves, cannot be

depended upon as diagnostic marks in the complication of hypertrophied prostate with urethral stricture any more than can the offensive ammoniacal smell of urine, as these symptoms are equally significant of either disease.

If an increased difficulty in micturition, or an incontinent dribbling of urine, should occur in patients advanced in life affected with urethral stricture, no time should be lost in ascertaining, by the introduction of the catheter, whether they possess the power of completely emptying the bladder. If urine, however small in quantity, be found in the bladder immediately after micturition, an elastic gum catheter without its stilet, if it can be passed, should be introduced once or twice daily, to prevent the irritation caused by continued retention of acrid urine. If an elastic catheter cannot be introduced, a silver one must be used, but the former is preferable to the latter, being productive of less irritation. Before using a silver instrument, however, the elastic gum catheter should be tried with its stilet.

In cases of enlarged prostate, Sir E. Home found that, when the catheter was stopped by the tumour, he was often successful in the introduction of the catheter by withdrawing its stilet for about two inches, which had the effect of tilting the point of the instrument over the obstruction.

Should the bladder sufficiently recover its power to evacuate the whole of the urine, the introduction of the catheter must, of course, be discontinued, and the stricture kept open by the occasional use of the bougie, which should be passed merely through the obstruction, so that the prostate may not be unnecessarily irritated.

If much difficulty be experienced in the introduction of the catheter, it should be retained for a few days,

and stopped with a wooden plug, which is to be taken out whenever the patient desires to pass his urine. By the retention of the catheter for a few days relieving the enlarged prostate from the irritation caused by acrid urine in the bladder, a diminution of the tumefied gland will probably ensue, and the patient may recover the power of complete micturition; or should there be still partial retention, catheterism may then be effected without difficulty. When ulceration occurs in the enlarged prostate, the sufferings of the patient are often most acute from violent spasm of the bladder in the expulsion of the last few ounces of urine. Enlargement of the prostate seldom goes on to any considerable extent, without causing inflammation of the vesical mucous membrane, which then secretes a viscid offensive mucus, thus adding to the pre-existing inflammation. The effects of enlarged prostate upon the bladder will be found particularly described under the heads of "Cystorrhœa," and "Sacculated Bladder."

In the advanced stage of prostatic hypertrophy, the bladder is usually thickened and incapable of containing more than from four to eight ounces of urine; although, occasionally, its retentive capacity is greatly increased. The pressure of the enlarged prostate upon the rectum may interfere with the due performance of the functions of that bowel, causing a difficulty in the evacuation of its contents, a sense of weight or bearing down, and sometimes a distressing tenesmus.

There can be no doubt that the great remedial measure in this affection, for which we are indebted to Sir E. Home, is the regular introduction of the catheter as long as requisite, to prevent the irritation arising from retention of offensive mucus and urine. The occasional abstraction of blood, by cupping on the loins, or by

leeching the perineum, has proved useful in many instances. The horizontal position should be adopted whenever there is much irritation. The bowels should be kept gently open.

If in retention from enlarged prostate it be found impossible to introduce a catheter, which will very rarely be the case when in skilful hands, there are only two other modes of proceeding that can be adopted for the patient's relief. The bladder must either be punctured above the pubes, or the point of the catheter forced through the enlarged prostatic lobe, when the instrument should be left in the bladder for a few days so that the artificial channel may become sufficiently consolidated for the subsequent evacuation of the urine.

As no internal medicine that I am aware of has yet been discovered capable of reducing an hypertrophied prostate, the medical treatment must be directed to the removal or mitigation of its effects, which will be noticed in their proper place. I believe that the injection of a pint of cold water into the rectum every morning, as recommended by Sir E. Home, will prove useful, by retarding its progress, particularly in the early stage of the disease. We are also recommended by Sir Everard and by Sir B. Brodie to keep a number of prostatic gum-catheters, mounted on strong iron stilets, for a considerable time before they are wanted, so that their curvature, which should be considerable, may be firmly fixed. It is desirable to use as large a catheter as can be passed, being less likely than a small one to catch against the enlarged prostate; but this, in cases complicated with stricture, must of course depend upon the extent of urethral contraction.

In every case of enlarged prostate, an examination should be made by the introduction of the finger into

the rectum ; for, although hypertrophy of the middle lobe cannot be detected in that manner, useful information may be obtained as to the extent of enlargement of the lateral lobes. When hypertrophy of the prostate gland is added to stricture of the urethra, on the introduction of a bougie, sufficiently small to go through the latter, it will be found that the point of the instrument, when arriving at the neck of the bladder, will be bent against the enlarged gland. The causes predisposing to this disease have usually been considered such as are most productive of general plethora, and more particularly of the genital organs, such as too free indulgence in the pleasures of the table, excessive venery, and riding on horseback.

Chronic enlargement of the prostate has very generally been considered a natural occurrence in old age. Some surgeons, however, have regarded this affection as the result of disease, and not as an almost essential accompaniment of advanced life. It is curious to contrast the opinions of two highly eminent and experienced surgeons upon this point. Sir B. Brodie observes : " When the hair becomes grey and scanty, when specks of earthy matter begin to be deposited in the tunics of the arteries, and when a white zone is formed at the margin of the cornea,—at this same period the prostate gland usually, I might perhaps say invariably, becomes increased in size." Mr. Guthrie tells us, that " A great mistake had been previously committed, and indeed now continues, that an enlarged prostate is a very common disease of old men, and particularly of the part called its third lobe. The point, I am happy to say, has of late been closely investigated by the surgeons of the Royal Naval Hospital, Greenwich ; and Sir John Liddell, Dr. Beith, and indeed all of them assure me, that

on the examination of the bodies of most of the old men who die there,—and from two to three hundred, or more, die annually of old age,—the enlargement of the prostate, and especially of the third lobe, is not commonly found in them.”

For the information of those interested in this subject, it may be as well to state, that, according to Mr. Adams, “a healthy prostate weighs five or six drachms.” My own comparatively limited post-mortem observations lead me to conclude, that amongst the poor, hypertrophied prostate is by no means a constant accompaniment of old age, whatever it may be with the rich, who are more exposed to its exciting causes, such as riding on horseback, high living, and other indulgences. It is probable that the truth will be found somewhere between the two extreme opinions recorded, and should it be my lot to attain advanced life, I shall endeavour to console myself with the opinion of my excellent friend, Mr. Guthrie, and not fancy that, to the various other infirmities of age, must necessarily be added an enlarged prostate.

I shall conclude this chapter by introducing the following highly important practical observations of Sir B. Brodie on the management of the catheter in retention from hypertrophy of the prostate: “When the catheter has entered the bladder, and the urine is evacuated, you must pursue one of two courses: either allowing it to remain in the urethra and bladder, secured by a proper bandage, and with a peg in the orifice, so that the patient may relieve himself whenever he has a desire to void his urine; or withdrawing it, and re-introducing it as soon as the bladder becomes again distended. Now, I do not mean to lay it down absolutely as a rule, that you should allow the catheter

to remain, but I am certain that it is prudent to do so in the great majority of cases. If you remove it, so abundant is the flow of urine which immediately takes place from the kidneys, that you will find the bladder again distended, and requiring the re-introduction of the catheter, within five or six, perhaps even within three or four hours. It will be necessary to use the catheter again, after another short interval ; and it will not unfrequently happen, although there has been no difficulty in the first introduction of it, that there is considerable difficulty afterwards.

“ You avoid all this by leaving the catheter in the bladder ; and there is another advantage in this mode of proceeding. The prostate gland is kept in a state of more complete repose, and in one much more favourable to recovery, so far as recovery can take place, than it would be in, if irritated by repeated introduction of the instrument.

“ After the catheter has remained in the urethra for some days, you may withdraw it ; and if the patient is now able to empty his bladder by his own efforts, it may be laid aside altogether ; otherwise, it must be regularly introduced once or twice in a day, or oftener, according to circumstances. Where the enlargement of the prostate and retention of urine have come on suddenly, the patient generally regains the power of emptying the bladder in the course of three or four weeks, and sometimes much sooner ; but where the disease has come on gradually, he never regains it completely. In the former case, he may be liable to a recurrence of the retention of urine, at longer or shorter intervals ; but in the latter, he is more or less of an invalid ever afterwards.”

CHAPTER XXIII.

PROSTATIC AND URETHRAL CALCULI.

PROSTATIC calculi, which are formed in the ducts of the prostate, consist almost entirely of phosphate, with a very small quantity of carbonate, of lime, and a little animal matter. They are occasional complications of stricture of the urethra. These concretions are usually of a light brown colour, varying in size from that of a pin's head to a small pea, although they are occasionally observed of much larger dimensions. When very small, more than a hundred of these prostatic calculi have been found in an individual ; but generally they are few in number.

The symptoms attending prostatic concretions are commonly obscure, not being easily distinguished from those of other affections of the prostate, or from stone in the bladder ; and when associated with stricture, it is very probable the attention of the surgeon will be so occupied with the latter affection that he will entirely overlook the former. When small, and not causing much enlargement of the gland, prostatic calculi have often remained undetected during life.

In many cases, however, they cause a sense of un-

easiness in the neck of the bladder and perineum, with more or less difficulty in micturition; and when of sufficient size or number to cause considerable enlargement of the prostate, the cyst in which they are contained may so much encroach upon the urethra as to produce complete retention of urine. When projecting in the urethra, on the introduction of a sound, they will usually be found to grate against the instrument, especially if at the same time counter pressure be made by the finger, introduced into the rectum. When associated with stricture, the dilatation of the latter should first be accomplished, and the surgeon's attention afterwards be directed to the prostatic disease. Sir B. Brodie gives us the result of his experience with regard to the treatment of prostatic calculi, in the following words: "We know of no medicine that is capable of preventing the formation of this kind of calculus; and in ordinary cases there seems to be nothing for us to do beyond the occasional introduction of a large bougie, to keep the urethra dilated, and thus favour the escape of the calculi as fast as they become disentangled from the ducts of the prostate, in which they have been generated.

"There are some cases in which a number of these calculi are collected in a cyst in the prostate gland, plainly perceptible by means of a metallic sound introduced into the urethra, and just before it enters the bladder; to be felt also from the rectum, sliding on each other under the pressure of the finger. In a case of this kind you may introduce a staff into the urethra; and with this for your guide, make an incision in the perineum, extending to the prostate, but not into the bladder, and thus extract the calculi. Several years ago, in a case of this kind, I succeeded in removing a

large number of prostatic calculi, with the assistance of Weiss's urethra forceps. There is always danger of some of these calculi finding their way into the bladder, and thus laying the foundation of calculi of that organ. This happened in the case to which I have just referred, so that after I had completely emptied the cyst of the prostate, I had to remove a considerable number of calculi of a still larger size, but of the same chemical composition, from the cavity of the bladder."

Besides prostatic, other small calculi formed in the kidneys or bladder, may descend into the urethra, and, lodging behind a stricture, either increase the difficulty of micturition, which previously existed, or cause complete retention of urine. These calculous concretions, when long retained in the urethra, often become much increased in size from depositions formed by the earthy salts of the urine. In some instances they have thus attained considerable magnitude, when the urethra has been greatly dilated, or the foreign body has been found embedded in a cyst of condensed cellular tissue, external to the canal through which it had previously escaped by an ulcerative opening.

A calculus may be originally formed in the urethra by the deposition of the earthy salts of the urine around some foreign body, such as a piece of straw or bougie, which has either intentionally or accidentally been passed into the canal in some part of which it has become fixed.

If, after full dilatation of the stricture, the calculus should be too large to pass with the urine, the stone must be extracted, if possible, by the urethra forceps, as it will, of course, be desirable to avoid incising the urethra, especially when the opening is required in that part of the urethral passage immediately above, or an-

terior to, the scrotum. In an urgent case of retention of urine from a calculus which has become locked behind a tight stricture, it may be necessary either to divide the obstruction by the lancetted catheter, and then extract the concretion by the urethra forceps, or to remove it by external incision. I should prefer the former method when the obstruction is in the straight part of the urethra; and the latter, when in the curved portion of the canal.

CHAPTER XXIV.

SPERMATORRHOEA ; OR, INVOLUNTARY SEMINAL
DISCHARGE.

THE occurrence of nocturnal emissions is often a source of considerable annoyance to stricture patients. These discharges are especially liable to take place when there is much morbid sensibility at the posterior part of the urethra. As might be expected, they are most likely to annoy patients with strictures at the vesical end of the bulb, or in the membranous portion of the urethra, than when the contraction is confined to the spongy part of the canal. There can be little doubt that the cause of these emissions is an extension of the urethral inflammation from the stricture to the ejaculatory ducts exciting a highly irritable state of the seminal organs. A patient of mine who had long suffered from an impassable stricture complicated with two false passages, when I first saw him, was affected to such an extent with these emissions, that generally three or four occurred nightly ; and if he slept for an hour in the day an emission was sure to occur, by which he was reduced to a state of extreme debility. The emissions gradually diminished as the stricture yielded,

and by the time a No. 9 sound could be passed, had entirely ceased.

The spermatorrhœa caused by stricture is very different to that which results from masturbation, the former seldom continuing long after the removal of the stricture, whilst the latter, especially when arising from atony of the seminal organs, often proves very difficult to cure, remaining for a considerable length of time after the cessation of the unfortunate habit from which it originated. I have frequently been applied to by patients with strictures at the bulb or membranous portion of the urethra, who have suffered great mental depression in consequence of nocturnal emissions, and also, as they imagined, from an escape of semen after evacuation of the bowels, especially when accompanied with much straining; but in many of the cases, from no spermatozoa having been detected by microscopic examination, it is most probable that the fluid discharged at such times was merely prostatic. In these strictures, attended with nocturnal emissions, I have generally found that a few gentle applications of *potassa fusa*, by removing the inflammation and irritability of the affected parts, have soon either entirely put a stop to the emissions, or much diminished the frequency of their occurrence. If there be reason to suppose that the urethral irritation has been kept up by the too frequent introduction of instruments, which, I believe, is not uncommonly the case, especially when patients have been in the habit of introducing bougies for themselves, then the use of instruments should be discontinued for some little time, and remedies employed to allay the local excitement.

In strictures caused by masturbation, complicated

with spermatorrhœa, the first object should be to dilate the obstruction, and then, if the seminal emissions still continue, other remedies must be employed. The nitrate of silver, so strongly recommended by Lallemande, is the remedial agent usually employed in these cases. In some instances, when the introduction of an instrument causes a sharp burning pain in the prostatic portion of the urethra, an application or two of lunar caustic will often produce the best results, by relieving the inflammation and morbid sensibility of the seminal ducts. The potassa fusa, from its miscibility with oily materials, is a much milder remedy than the nitrate; I have generally had recourse to it in the first instance, and have not often been obliged to resort to the latter; indeed, the caustic potash appears to me to be scarcely, if at all inferior to the lunar caustic in these cases; and when properly used is never followed by the severe suffering so frequently resulting from the application of the solid nitrate. When there has been scarcely any pain on passing an instrument through the prostatic portion of the urethra, the spermatorrhœa appearing to depend principally upon atony of the seminal ducts and morbid irritability of their associated organs, I have found most benefit from the occasional introduction of as large a metallic sound as the urethra would bear without irritation. The instrument has usually been retained in the urethra from a quarter to half an hour. The pressure of the sound most probably produces a more healthy state of the orifices of the seminal ducts, which are often relaxed and patulous in such cases; but whatever may be the precise mode of its action, the effect of the instrument, when used for some length of time, has certainly been beneficial. General tonic re-

medies such as give power without stimulating too much, should at the same time be employed; more especially cold bathing, which should be used in the mode best adapted to the constitution of the patient, the shower-bath being probably the most invigorating where it agrees.

CHAPTER XXV.

GLEET.

PERSONS with stricture are frequently subject to a discharge from the urethra which may be either mucous, serous, or muco-purulent. In these cases there is more or less chronic inflammation of the lining membrane of the urethra, and principally situated immediately behind the obstruction. The membrane of the contracted portion itself is, however, commonly inflamed, as is sometimes also that just in front of the obstruction. The discharge may be so slight as scarcely to stain the linen, or merely sufficient to agglutinate together the lips of the urethral orifice ; whilst in other cases, it may be so abundant as to resemble, and be mistaken for, a gonorrhœa.

Persons with bad strictures may probably be scarcely ever entirely free from gleet ; although, in general, the discharge is not constant, but occurs occasionally, being produced by whatever causes irritation of the affected parts. The discharge will, in some cases, entirely cease for weeks, or even for months ; and then, from cold, venereal, or other local excitement, return as abundantly as ever. The discharge, if caused by stricture, usually

subsides when the latter is cured. In addition to the introduction of the bougie, the administration of some of the internal remedies commonly employed for gleet when independent of stricture, will often assist the local treatment, with the exception, however, of those which are too stimulating, such as cubebs and tincture of cantharides.

As it is the continuance of gonorrhœa in a chronic form, indicated by a thin gleety discharge, that so often induces a slight thickening of the mucous membrane of the urethra, which eventually constitutes stricture, it is, of course, always highly desirable to pay strict attention to such discharge however slight it may be.

Gleet appears essentially to consist in chronic inflammation of the muciparous glands and lining membrane of the urethra. The scalding sensation so painful during micturition, in the earlier stages of gonorrhœa, is seldom experienced in gleet, except from an accession of inflammation which may occasionally occur from one excess or other.

This disease, trivial as it may appear, has often baffled the skill of the ablest surgeons. It is in persons of weak constitution with disordered digestive organs, especially when of strumous habit, that gleet is most likely to resist the remedies usually employed for its suppression. It should always be borne in mind that the gleet which follows gonorrhœa is occasionally infectious, and as long as any discharge remains, the patient should be informed of the possibility of communicating disease. For two reasons especially, it is most desirable to cure a gonorrhœal gleet. These are its possibly infectious character, and its tendency to the production of stricture. The means to be adopted for its removal are general and local. The former comprise such reme-

dies as, by their stimulating effects upon the mucous surface of the urinary organs, have proved most successful in causing a healthy action of the congested or inflamed vessels. Of these remedies, the copaiba balsam stands first in efficacy; next the cantharides; then cubebs; after which iodine, quinine, iron, sarsaparilla, and various other tonics. Each of these medicines separately employed, may fail in curing the disease, when the judicious combination of some of them will often succeed. The combination of medicines of the same class is indeed often attended with very successful results. For example, I have failed in procuring sleep for the restless sufferer by the separate exhibition of the different preparations of opium, camphor, the extracts of henbane, hemlock, or poppy; when by the administration of half a grain or a grain of the muriate or acetate of morphia, with five grains of the extracts of poppy and henbane, the desired effect has been produced. So it is with stimulating remedies in gleet; when tried individually each will very probably fail, although the combination of some of them may prove successful.

I have found the balsam of copaiba, combined with the tinctures of cantharides and sesquichloride of iron more generally successful in the cure of gleet, not dependent upon stricture, than any other internal remedies. If, after a fair trial, the above combination should fail, either the tincture or the powder of cubebs may be substituted for the tincture of sesquichloride of iron. These remedies must, of course, be made as little disagreeable as possible by the addition of syrup and any aromatic water that may be most palatable to the patient.

Where there is any disposition to scrofula, very excellent effects are often experienced from a combination of the iodide of potassium, with the compound extract of

sarsaparilla, the tincture of cubebs, and compound infusion of gentian. In gleet attending stricture, I generally employ the alkaline solution of copaiba, if there exist no objection to the use of that remedy, combined with tincture of henbane, in preference to such as are more stimulating.

The most efficient local remedies are injections of nitrate of silver, of bichloride of mercury, the chloride of zinc, the sulphates of that metal, of copper, and of alum; also the acetate of lead. These injections should be used successively, as one will often succeed when another has failed. They should be used at least three or four times daily, and retained for one or two minutes in the urethra. The occasional introduction of the bougie in these chronic discharges has frequently an excellent effect. The pressure of the bougie appears to remove the congestion or chronic inflammation of the lining membrane of the urethra, and will sometimes succeed when other remedies have failed. In some cases of an unusually obstinate character, where there has been no stricture, I have used with good effect a bougie besmeared with mercurial, or tolerably strong nitrate of silver, ointment. Counter-irritation in the perineal region by frictions with emetic tartar ointment, or by the occasional application of blisters, has sometimes proved useful. The cold bath, both local and general, more especially sea-bathing has proved of great service in these cases.

In some instances a gleety discharge may depend upon the irritation caused by an enlarged mucous follicle of the urethra, originating in inflammation, and remaining in a state of chronic induration. These follicular tumours are sometimes very small, and cause no irritation, whilst at others, they are as large as a

full-sized acorn, and may then offer an obstruction to the introduction of a bougie, as well as to the exit of the urine. The situation of these enlarged follicles is most frequently near the frænum, although they are sometimes observed lower down in the urinary canal. They occasionally suppurate, and break either externally or internally. By the former occurrence the disease will, in general, be cured, although there may remain for some length of time more or less induration of the affected part. In the latter event the cure is usually more protracted, from the urine finding its way into the sac of the abscess. In such a case a small compress of lint secured in its place by adhesive plaster, so as to compass the sac, may assist its contraction.

I have known these tumours to remain for many months, and keeping up more or less gleet discharge, and then gradually subside without the occurrence of suppuration. The treatment which I have usually adopted for their dispersion has been by paying strict attention to the state of the digestive organs, by the external application of an ointment composed of iodide of potassium and mercurial ointment, and occasionally by painting them with the tincture of iodine. As one means of dispersing these tumours, Sir B. Brodie mentions that of "keeping the patient in bed with a gum catheter in the urethra and bladder. This plan," he tells us, "may be pursued for a few days each time, and repeated at intervals, until the tumour is nearly dispersed. The gum catheter should be of small size; a large one will produce an effect exactly contrary to what you wish, irritating the gland, and exciting a fresh attack of inflammation in it." When the abscess bursts internally, and cannot be made to heal by the application of external pressure to the sac, Sir B.

Brodie advises, that "a director should be introduced into the urethra, and an incision then made so as to establish a free external opening leading to the centre of the abscess, dressing the parts afterwards with some stimulating ointment, and applying occasionally the nitrate of silver."

When gonorrhœa is associated with stricture, the use of instruments should, of course, be discontinued, until of the former there remain nothing more than a slight gleet discharge, unless retention of urine render the introduction of the catheter necessary, in which case one of gum elastic is to be preferred, as causing the least irritation. Injections should not be used until the gonorrhœal discharge has assumed its gleet form, and there remain but a slight degree of urethral irritation.

CHAPTER XXVI.

HÆMORRHAGE FROM THE URETHRA.

DISCHARGE of blood from the urethra may be the result of external injury, of the passage of calculous concretions, or of the venereal orgasm; but in cases of stricture it is generally caused by the introduction of instruments; and when the armed bougie of Sir E. Home was in common use, severe hæmorrhage sometimes followed the separation of a slough. In some instances the lining membrane at the seat of disease is so extremely vascular that a few drops, or tea-spoonfuls of blood will flow, however gently an instrument may be passed, which state of inflammation or congestion is best relieved by two or three mild applications of potassa fusa. If, in attempts to dilate a stricture, the lining membrane of the urethra be lacerated, a more free hæmorrhage may then take place, and proceed to such an extent as to alarm the patient, more particularly as blood and urine coagulating together in equal proportions, the loss of the former is often supposed to be double its real amount.

Sir Everard Home, in his Clinical Lectures, delivered at St. George's Hospital, declared that he never knew

hæmorrhage from the urethra to prove fatal. I have never witnessed any of those profuse discharges of blood which have been described as sometimes produced by the free use of caustic, but have occasionally known considerable hæmorrhage to result from the introduction of instruments. The most profuse sanguineous discharges proceed from the posterior part of the urethra, where the vascularity is greatest. Although these hæmorrhages are mostly the consequence of treating a stricture too roughly, they may occur when no improper force has been used, and when the introduction of the instrument which caused the bleeding has given the patient scarcely any pain. Some persons seem peculiarly predisposed to hæmorrhage from the mucous surfaces, and in such, when a discharge of blood occurs, it continues unusually long. However alarming these sanguineous discharges from the urethra may be to the patient, by the surgeon they are regarded as of little importance, from his confident reliance on the resources of surgical art for their speedy suppression.

If called to a patient with rather profuse urethral hæmorrhage, effectual means must be taken for its suppression, which can be readily effected by the application of pressure. The closed fingers should be placed as far backward as possible on the perineum, and gradually brought forward, making firm pressure on the urethra all the time, until the flow of blood from the penis ceases, which will be a proof that the bleeding vessel or vessels are compressed. Particular care must be taken that the pressure be made upon the precise spot from whence the hæmorrhage proceeds; for if made anterior to it, although no blood may escape from the penis, yet it will pass backward into the bladder. To avoid such an occurrence, when the flow of blood

ceases, it is only necessary to move the fingers a little backward until the discharge again takes place, by which means the exact situation where the pressure should be made can always be ascertained.

The introduction of a silver catheter as large as can be passed, would of course assist the effect of a perineal pressure ; but as hæmorrhage from the urethra, for the most part, results from laceration, this proceeding is, I think, not often desirable.

It is seldom necessary to continue the pressure long. If the surgeon cannot conveniently make the pressure, he can direct an assistant to do it, or the patient himself may be taught to accomplish the matter very efficiently by making pressure with a firm compress, made with a flat narrow piece of wood or cork wrapped in lint or linen. If, as not often happens, it be impossible to command the flow of blood by pressure, then the bleeding must proceed from the posterior part of the urethra at its prostatic or vesical portion, when, should it have been caused by the introduction of instruments, it will in general soon cease, on the application of cloths dipped in cold vinegar and water to the perineum and over the supra-pubic region. If the hæmorrhage should be great, and not easily suppressed, pounded ice in a bladder must be applied, and a full dose of opium, with the acetate of lead, should be administered. The acetate must be continued as long as the hæmorrhagic tendency continues ; or other styptics may be tried, such as gallic acid, spirits of turpentine, the combination of alum, and full doses of diluted sulphuric acid, &c. An injection of cold water, per rectum, may also prove useful. Blood sometimes finds its way into the bladder, and there coagulates, causing much suffering. The proper practice in such a case is to inject the bladder

with warm water. A double catheter is generally used. It should be moved freely about the bladder, so that the coagula may be broken before using the warm water. The water dissolves the blood, and of course facilitates its removal. Dr. Gross recommends on these occasions an injection of tepid water and acetic acid, in the proportion of one ounce of the latter to five ounces of the former, believing this preferable to the use of warm water alone, from the circumstance of vinegar being a powerful solvent of blood. If these measures should fail in emptying the bladder of coagulated blood, which will rarely be the case, and the symptoms of retention of urine become urgent, then the vesical cavity must be relieved of its contents by an incision through the perineum, as in the lateral operation for lithotomy; or above the pubes, the former being preferable, if there be no valid objection to its employment.

Hæmorrhage from the bladder is not a common consequence of stricture. A case, however, occurred to me some time ago, where it appeared to have indirectly resulted from that cause. I was requested to see a poor man who had considerable discharge of blood from his bladder, which he said was caused by lifting a heavy weight. Notwithstanding the use of full doses of opium, with acetate of lead, as well as the application of ice to the perineal and supra-pubic regions, the hæmorrhage continued unabated, and it became evident the man would soon sink unless something more efficient was done for him. It then occurred to me that injecting the bladder with some astringent might probably succeed in stopping the flow of blood. On proceeding to inject the bladder with a solution of a drachm of alum to half a pint of water, I found a stricture at

the bulb, through which a No. 3 catheter was passed with difficulty. After the first injection, scarcely any blood was passed for three days, when there was a slight return of hæmorrhage; and as the man had been much exhausted by his previous loss of blood, I repeated the injection, after which there was no return of bleeding. In this case it is most probable that the mucous membrane of the bladder was in a state of congestion or inflammation from the obstruction caused by the stricture to the free discharge of urine, and very probably being distended at the time of injury, some vessel or vessels were ruptured.

CHAPTER XXVII.

FALSE PASSAGES.

THESE are generally formed by unjustifiable violence in the use, or rather the abuse, of instruments. They are mostly situated at the bulb, and are commonly caused by the end of the catheter, bougie, or sound having been allowed to sink too low at that point; and when forcibly urged forward the urethra is ruptured, the instrument passing under, or by the side of, the membranous portion of the canal. Sometimes the false passage is of considerable length, running between the compressor urethræ and superficial sphincter ani muscles, as far as, or even beyond, the neck of the bladder. Another situation in which a false passage has often been made, is at the termination of the membranous portion of the urethra, the artificial channel passing through a perforation of the prostate gland into the bladder. In some instances a false passage has been observed traversing for a short distance under, or by the side of, the urethra, but again re-entering the canal before it reaches the bladder.

False passages vary in extent from a few lines to several inches, and occasionally pursue their course in immediate contact with the urethra. They become

lined with an adventitious membrane, and in many instances have been found very efficient substitutes for the natural canal. False passages are seldom followed by urinary extravasation, the principal reason for its non-occurrence is doubtless that which is commonly assigned, viz., that the direction of an abnormal channel being obliquely backward towards the bladder, the urine does not find a ready entrance into it, as its natural course is exactly in the opposite direction. It must also be recollected that false passages are usually so gradually made that the inflammatory lymphatic effusion resulting from the injury very effectually prevents the escape of urine. When the lining membrane of the urethra is torn by the point of a sound or catheter, the peculiar sensation communicated to the hand cannot well be mistaken by one accustomed to the treatment of stricture. If the mucous membrane of the urethra should be lacerated, an occurrence which must have happened occasionally to every experienced surgeon, the instrument should be immediately withdrawn, and the urethra left quiet until the breach of surface have time to heal. The passage through the triangular ligament is the principal difficulty experienced by those unaccustomed to the frequent introduction of instruments into the bladder; for if the point of an instrument be not kept well to the upper part of the urethra, it is apt to sink into the sinus of the bulb, and to pass under, instead of through, that ligament, when should much force be employed, a false channel may result.

The triangular ligament may sometimes cause obstruction in more practised hands, as was, I presume, the case in a dispensary patient of mine somewhat hypochondriacal, who was under my care with a stric-

tured urethra, and who came to me one morning in very great alarm, and with a countenance that seemed to portend some terrible disaster. As soon as his extreme agitation permitted him to use his tongue, I learned that he had been to consult another surgeon, who, after having attempted to pass a catheter, assured him that there was no possibility of getting an instrument into his bladder, and that a false passage had been made. The gentleman was also kind enough to show him some plates, by which he explained geographically the precise road my instrument had taken, and at the same time assured him that the channel to his bladder was impassable. The man's story somewhat surprised me, as two or three days before I had passed a No. 11 steel sound into his bladder without the slightest difficulty. To convince him that his fears were groundless, in the presence of one of my pupils, I introduced easily a No. 11 silver catheter, and his satisfaction was no less than his astonishment when the urine flowed freely through the instrument.

In sixty-eight preparations of stricture which I examined, there were false passages in nineteen, and in two of the nineteen a false passage was observed to run for some little distance on each side of the urethra. It is commonly supposed that by far the greater number of false passages are made in the under part of the urethra. In the nineteen examples the result was as follows :—

In the under part of the urethra	10
In the upper part	2
At the side (in two of the cases two passages)	9

It is, I believe, generally imagined that an instrument is never grasped in a false passage as if by a stricture. When a false passage is made below a stricture,

it usually goes under the thickened tissue formed by the disease, and although it may extend to ten or twelve inches, even as far as the vesiculæ seminales, an instrument will seldom be very firmly grasped. When, however, a false channel exists by the side or above the urethra, an instrument will often be as firmly grasped by the tough fibro-semi-cartilaginous tissue, as by the stricture itself. The sensation communicated to the hand when an instrument has been passed into such a false passage, will often be so similar to that caused by a hard stricture, that the one can scarcely be distinguished from the other. When these false passages take nearly the natural course of the urethra, even the most experienced surgeon may sometimes be confident that his instrument is in the right, when, in reality, it is in the wrong channel. These false passages can, I think, be almost always avoided, if solid curved instruments be used; but bougies, whether of plaster or elastic gum, will occasionally enter the artificial channel, notwithstanding the greatest care may have been taken to prevent them. In cases of impassable stricture, complicated with one or more false passages, and where frequent attempts have been made to pass instruments, all such attempts should be given up for some little time whilst the patient is kept as quiet as possible, and care taken that the bowels are but little disturbed. Medicines which allay irritation should be administered, such as the tincture of hyoscyamus and liquor potassæ. By these means, continued for three or four weeks, the irritation of the stricture, caused by the frequent introduction of instruments into the false passage, will often be so much diminished as to enable the surgeon to pass an instrument into the bladder, whereas, previously, that operation had been quite impracticable.

CHAPTER XXVIII.

CHORDEE.

THIS affection, most frequently observed in gonorrhœa, occasionally occurs in stricture, and is caused by an effusion of lymph into the cells of some part of the corpus spongiosum, by which they become agglutinated, so as to prevent the free ingress of blood; the consequence is, that the penis during erection may be bent downwards, upwards, or on either side, the particular direction depending upon the locality of the lymphatic effusion. There is often considerable induration of some portion of the urethral tube, which can usually be felt distinctly by the finger. Chordee, when resulting from stricture, is caused by the inflammation at the seat of disease, extending from the urethra to the corpus spongiosum. Mr. Guthrie considers that chordee itself may be the cause of a very troublesome form of stricture, in which "the hardness is something like a cord, and occasionally like a small hazel nut." Mr. Guthrie observes, "This kind of disease is very apt to form when the urethra is ruptured, during the severity of what is termed a chordee. It yields to the distending power of the two erectile bodies, and the inflamed

part is torn ; the tear extends into the spongy body itself ; the blood flows freely from the orifice of the urethra, and the cells of the corpus spongiosum around the rupture become loaded with it. Inflammation follows, and without great care be taken in the treatment, a permanent stricture is the result." Unless of a gristly hardness, the thickened tissue usually becomes gradually absorbed, as the stricture becomes dilated. A little camphorated mercurial ointment, with a small quantity of iodide of potassium, rubbed gently over the affected part every night, may probably assist in promoting absorption of the indurated part.

HYPERTROPHY, OR ENLARGEMENT OF THE PENIS.

In some cases of stricture, where there has long been considerable difficulty in micturition, the penis becomes more or less enlarged, being longer and thicker than natural, apparently from a generally congested state of its bloodvessels. The prepuce in these cases is frequently œdematous. The hypertrophy is supposed to be caused by the habit which the patient acquires of pulling and elongating the penis, to assist in the expulsion of the urine. I have, at the present time, a gentleman under my care who has suffered from stricture for the last twenty years, and whose penis when he first came to me was, according to his account, full one-third larger than natural, having a distorted appearance. In addition to the general enlargement, there was considerable thickening and hardness to be felt in the under part of the urethra at the bulb, caused by the extension of inflammation of the urethra to its external tissues. In these cases, the enlargement of

the penis gradually subsides as the urine finds a free passage ; and in the instance just mentioned, the organ has nearly resumed its natural appearance, the stricture being now sufficiently dilated to admit a No. 11 bougie.

CHAPTER XXIX.

INFLAMMATION OF THE TESTES.—ORCHITIS.

INFLAMMATORY enlargement of these organs occasionally occurs in cases of stricture, and may be either the result of the obstruction itself, or of the treatment employed. If from the former, it is mostly chronic, the enlargement taking place very gradually, and without much pain, being sometimes complicated with hydrocele; if from the latter, the inflammation is in general more acute, the pain more severe, and the swelling more rapid. When inflammation is acute, and caused by the introduction of instruments, from a dozen to eighteen leeches should be applied to the scrotum; and afterwards warm poppy fomentations and poultices. The scrotum should be suspended, and the horizontal position strictly enforced, when practicable. A draught should be given every four hours, containing from a quarter to half a grain of emetic tartar, two drachms of Epsom salts, and twenty drops of the wine of colchicum, in an ounce of camphor mixture. Twelve grains of Dover's powder, with two of calomel, should also be given at bed-time. The application of the leeches must be repeated in a day or two, if there should be

much pain or swelling. Warm applications generally afford more relief than cold, by relaxing the tunica vaginalis, the rapid distension of which often causes much suffering. The urethra should be left undisturbed by any instrument until the subsidence of the inflammation. When the enlargement of the testis is not caused by the introduction of instruments, but results simply from the extension of inflammation along the ejaculatory ducts, and is of a chronic kind, a very different treatment must be pursued. The inflamed testis in these cases has often a scirrhus-like hardness, and the pain is then seldom constant, more frequently occurring in paroxysms not usually of a severe character.

In this chronic enlargement of the testes, mercury is almost a specific ; and when the patient is fairly under its influence, seldom fails to cause absorption of the effused lymph, and the gradual restoration of the inflamed organ to its healthy state. As the inflammation has been produced by the irritation resulting from the pressure of the urine against the stricture, by proceeding in its dilatation, and consequently diminishing such pressure, we shall greatly assist the action of the mercury in curing the disease. The stricture should therefore be gradually and very gently dilated by the bougie or sound, as if it were uncomplicated with inflamed testis. The good effects of dilatation of a stricture under these circumstances, I have in many cases experienced.

When the swelling is of a chronic character, the application of leeches will seldom be advantageous ; but the part affected should be covered with flannel spread thickly with camphorated mercurial ointment, over which a piece of oiled silk may be placed. If, as occasionally happens, paroxysms of rather acute pain be

experienced, a fourth part of extract of belladonna should be added to the mercurial ointment. If the ointment prove too irritating to the skin, some fresh lard can be added to it. In all cases of inflammation of the testes the scrotum should be suspended; and when practicable, unless the swelling be of the chronic kind, a recumbent position is to be enjoined. Compression of the inflamed organs by straps of adhesive plaster has been strongly recommended in these cases, but having seen much irritation ensue from the practice, I am no advocate for its adoption.

CHAPTER XXX.

ABSCESSSES AND FISTULÆ.

IN some cases of stricture the urethral inflammation, having extended to the external tissues, may terminate in suppuration, and the abscess have no communication with the urethra itself; or such an abscess, by its pressure upon the urethra, may cause an ulcerative opening in that canal. In other instances, ulceration commencing within the inflamed urethra, effects a slight breach in the canal, through which a few drops of urine may escape, causing suppurative inflammation in the external cellular tissue. Should, however, the ulcerative breach be sufficiently large to permit a more free escape of urine, extravasation to any serious extent may still be prevented by the previous occurrence of inflammatory condensation, and the mischief be confined to the occurrence of a fistulous abscess.

Abscesses resulting from stricture, but having no urethral opening, do not usually become fistulous, although, if neglected, especially in strumous subjects, they may extend to the neck of the bladder, and burrowing by the sides of the rectum, open in the nates, or even burst into the intestine itself, leaving sinuses which may require an operation.

Abscesses communicating with the urethra, whether opened by nature or art, leave for a time sinuous apertures, through which urine will escape during micturition, in greater or less quantity, according to the extent of obstruction to the natural passage, the size of the urethral opening, and the direction of the fistulous channel. The more easily the urine can escape through the fistulous track or tracks, of course, the less likely will it be to pass by its natural outlet, which is more or less obstructed.

Urinary abscesses may burrow and open in several places, so that, in some aggravated cases, there may be fistulæ in the pubic, inguinal, and perineal regions.

An urinary abscess may have no external opening, but empty itself into the urethra through an aperture in that canal, in which case an external incision should be made, communicating with the cavity of the abscess, which can be done when there is a sufficient collection of matter to be felt by the finger. It is highly important that all abscesses connected with disease of the urethra should be opened as early as possible. There is one kind of urinary abscess that is very likely to remain for a long time undiscovered, the nature and treatment of which have been so clearly described by Sir B. Brodie, that I am induced to quote the following passage from his "Lectures on the Diseases of the Urinary Organs:" "A patient may apply to you, who perhaps has had gonorrhœa formerly, followed by a slight obstruction of the urethra, complaining at the same time of a discharge from the urethra, which he calls an obstinate gleet. You examine the perineum, and you find in it a small tumour, not larger than a horse-bean or filbert. It is at some distance from the surface, and the patient says that it has been co-exist-

ent with the gleet, and that it is sometimes inflamed and tender. Now this little tumour indicates the existence of a blind fistula. There is a small orifice in the urethra, and a narrow channel leading from it into the centre of the tumour, and every time that the urine flows, a very minute quantity finds its way into this channel, escaping from it immediately afterwards by regurgitation into the urethra. In consequence of the smallness of the cavity, and the quantity of solid matter deposited on its outside, the fluctuation of fluid in it is not perceptible. I have known this state of things to continue, producing more or less occasional inconvenience, for some years. The first thing necessary to the cure is to make an opening in the perineum, leading into the cavity in the centre of the tumour. But this may not be very easily accomplished, on account of the smallness of the cavity. You should introduce the lancet somewhat obliquely, so as to divide the tumour as nearly as possible through its centre. Then introduce some lint, so as to prevent the wound from uniting by the first intention. After three or four days you may remove the lint, and then you will ascertain whether you have done what was required, by observing whether, when the patient voids his urine, any portion of it flows through the opening which you have made. If this be the case, nothing further is required than that the stricture should be dilated in the usual way. If, however, no urine flows through the opening, you may proceed thus: introduce a probe, the end of which has been armed with caustic potash (by being dipped in the caustic in a melted state), through the wound into the centre of the tumour, so as to make a considerable slough. A portion of the tumour being thus destroyed, the probability is, that when the slough

has separated, it will be found that the central cavity is exposed, and that you have accomplished the object which you had in view."

Abscess of the prostate may result from stricture, most probably from the urethral inflammation extending to the prostatic ducts, and affecting the gland itself, eventually terminating in suppuration. If left to itself, such an abscess is most likely to burst into the urethra.

When an urinary abscess has opened externally close to the rectum, forming a fistula in ano, it may be sometimes necessary to perform the usual operation for that disease.

When an abscess bursts into the rectum, and has also an opening in the urethra, the condition of a person so affected is deplorable, as the unnatural communication may possibly remain for life, although, even under such circumstances, a cure has been effected by keeping the urethra well open. Let the possibility of so unfortunate a termination of urinary abscesses induce the surgeon to pay prompt attention to any swelling or sense of weight experienced in the perineum. In all such cases a free external opening for the escape of matter should be made as soon as possible.

Urinary abscesses may, of course, result from other causes than stricture, such as accidental injuries of the bladder, and occasionally the operation of lithotomy. Their contents are usually dark coloured and fetid.

URINARY FISTULÆ are frequent complications of stricture, especially when the urethral obstruction has been of long duration. Although stricture is by far the most common cause of these fistulæ, they may, however, be the result of acute urethritis; of lesions of the urethra, either accidental or from operations. There may be several external fistulous openings, with

but one in the urethra. The parietes of the fistulæ and neighbouring parts are more or less condensed ; and in some cases the perineum and scrotum have an almost cartilaginous induration.

The fistulous orifice externally has commonly a red granular appearance, slightly raised above the surface. The sinuous track is lined by a membrane very similar to the mucous lining, but having no follicles.

Much has been written concerning the best method of treating urinary fistulæ, and formerly it was considered almost indispensable to lay freely open with the knife every fistulous sinus. Such a course, however, is not often adopted by good surgeons in the present day, as it has been found unnecessary. With regard to my own practice, I seldom pay much attention to fistulous complications of stricture, well knowing that, with some few rare exceptions, the cure of the latter is also the cure of the former. The fistulæ will in general gradually contract as the stricture becomes more open ; and by the time it is fully dilated, or soon afterwards, they will heal without further trouble. In some cases, however, a few drops of urine will still find their way through the fistulous channels for many weeks or months after complete dilatation of the urethral obstruction has been effected. Although, even in such instances, it is very probable that the regular introduction of the metallic sound, if continued with due perseverance, would eventually effect a cure of the sinuses, their healing may certainly be assisted by stimulating applications, such as the nitrate of silver, or the strong nitric acid. A very good way of assisting the contraction of these sinuses, is by dipping the blunt end of a probe into melted nitrate of silver, and passing it occasionally along the fistulous tracks. Sir B. Brodie recommends

that the external fistulous orifice should be lightly touched once in a week or fortnight with the caustic potash, as it is more likely to heal than the opening into the urethra ; also that the application of nitrate of silver should be confined to the bottom of the sinus. In some fistulous openings in the urethra anterior to the scrotum, it has been found that the only efficient means of closing the sinuses was by the urethro-plastic operation.

Absorption of the effused lymph in the neighbourhood of the fistulous tracks may be promoted by gentle frictions night and morning, with a combination of the iodide of potassium and mercurial ointments, which must be rendered milder by the addition of spermaceti ointment, if it should irritate the skin, which is frequently the case. It is perhaps scarcely necessary to add, that in all cases of urinary fistulæ, the patient's health should be kept in the best possible state by the exhibition of such medicines as may be required, by attention to the state of his urine, his diet, and his general habits.

CHAPTER XXXI.

IRRITABILITY OF THE URETHRA.

THE lining membrane of the urethra possesses naturally a high degree of sensibility, and often becomes morbidly sensitive under the influence of the various exciting causes to which it is exposed. The urethra and bladder being well supplied with nerves, both from the cerebro-spinal and the organic or sympathetic systems, as might be expected the functions of the former occasionally become disturbed in consequence of the derangement of other organs. Several of the causes of irritability of the urethra are entirely independent of any morbid change in the canal itself, the increased sensibility being either produced by its sympathy with affections of other parts, or from irritation, the result of an unhealthy state of the urine, and the different acrid secretions to which its internal surface is sometimes exposed.

From the intimate association of the genito-urinary organs, derangement of the functions of any one of their component parts is very likely to produce more or less disorder of another. The cause of an irritable urethra may be the presence of a stone in the kidneys, bladder,

or ureters, producing irritation in the lining membrane of those organs, and affecting the urethra sympathetically. An ulcer may produce similar effects. A not unfrequent cause of irritability of the urethra is an acrid state of the urine, especially when it contains a large proportion of the lithates, as in persons subject to gout or to scaly eruptions, of sufficient extent materially to obstruct the natural cutaneous exhalations. Another cause of urethral irritability may be either inflammation of the lining membrane of the bladder, or enlargement of the prostate gland. The vitiated mucus secreted in chronic cystitis often proves highly irritating to the urethra.

Many of the causes of irritability of the urethra originate, however, from some derangement of structure or function of the canal itself, and of these stricture is certainly the most common. In most cases of urethral contraction, there exists more or less morbid sensibility of the lining membrane of the canal, the irritability being usually confined to the seat of disease and its more immediate vicinity, although the entire urethral passage is sometimes morbidly sensitive. The cause of this affection may be an exalted sensibility of some part of the urethral mucous membrane, probably its membranous or prostatic portion. In such cases, I believe, the increased sensibility mostly depends upon the presence of more or less inflammation of the affected part. Gonorrhœa, especially when much protracted, is a frequent cause of irritable urethra. Several months after the occurrence of the former affection, it is not unusual for a patient to find that his urine is not passed so freely as formerly, whilst, very probably, the lips of the urethra have a slightly red, swollen appearance, and are agglutinated in the morning. He may also have a

sense of heat or aching in the urethra, extending to the perineum, during, and for a short time after, micturition. The urethral irritability, in this instance, depends upon the presence of inflammation in the lining membrane of the canal ; the disease is, in fact, a chronic urethritis ; but it is one that I have known very frequently to be mistaken for stricture.

In this affection, although the stream of urine may be very small at the commencement of micturition, it will generally be found to enlarge considerably before its termination. As, however, the symptoms of this chronic urethritis, when the disease has long continued, very much resemble those of stricture, and are, moreover, especially apt to produce that affection, a careful urethral examination should be made. In such an examination two precautions are very essential to the formation of a correct diagnosis ; first, that the greatest gentleness is used, or spasm may be induced ; secondly, to employ a good-sized instrument properly curved, as, if small, from its being more likely than a larger one to become arrested by the lacunæ, the folds of the urethra, the triangular ligament, or other occasional causes of obstruction, it is very probable that the true nature of the disease may be entirely mistaken. The urethra often becomes in a high degree morbidly sensitive in those who have been much addicted to masturbation. Excessive venery may have a similar effect.

The various causes of urethral irritability which have been adduced must be sufficient to show the necessity of endeavouring, if possible, to ascertain the source of irritation ; and as most of them are attended with some pain and difficulty of micturition, the precise nature of the affection has often been mistaken. It will be seen that an error in the diagnosis may prove of

serious importance to the patient, as there can be little doubt that the continued introduction of bougies in cases of mere irritability of the urethra has not unfrequently been the cause of a permanent stricture.

It should always be recollected that an irritable urethra is usually predisposed to spasm, so that on the introduction of an instrument it will very probably be arrested or grasped at the bulb or membranous portion of the canal, although there may be no permanent obstruction. It is highly probable that a surgeon may at first mistake a spasmodic for a permanent contraction; yet no mischief can arise if a simple rule be observed, which is always to use great gentleness in the introduction of instruments, and never to persist in their use when they produce no perceptible good effects. In the morbidly sensitive urethra caused by masturbation, I have sometimes found useful the occasional introduction of bougies besmeared with an ointment containing one part of extract of belladonna to seven parts of lard. In cases in which the irritability is confined to a small portion of the urethra, two or three mild applications of potassa fusa will often prove beneficial, as may also the nitrate of silver ointment, as used by Mr. Guthrie.

In the treatment of a disease dependent upon such a variety of causes, everything must depend upon the judgment of the surgeon, who will of course endeavour to ascertain the source of the irritability, and then to remove it, when within reach of his art. In all cases, however, of this affection, the strictest attention should be paid to the general health, and the state of the urine, so that it may prove as little irritating as possible to the sensitive urethral membrane. The treatment of irritable urethra, when associated with stricture, has been previously described; but this slight

sketch of various other sources of urethral irritability may probably prove useful in preventing errors in diagnosis.

ULCERS ON THE GLANS AND PREPUCE.

Amongst the consequences of stricture must not be omitted the occasional occurrence of ulcers on the glans and prepuce. The ulcers dependent upon morbid thickening of the urethra are mostly of the herpetic kind, and are sometimes very troublesome to the patient from their frequent recurrence. If accompanied by surrounding inflammation, the acetate of lead lotion is a very good application. When of a more chronic character, stimulants should be used, such as the black wash, the nitrate of silver, or sulphate of zinc lotions, containing from two to six grains of the salts to an ounce of distilled water. As these ulcers often appear when the digestive organs are impaired, attention should be paid to their correction. If the ulcers become very indolent, they may be touched occasionally with the solid nitrate of silver. In many cases, however, the recurrence of the ulcers can be prevented only by the restoration of the urethra to its healthy state.

CHAPTER XXXII.

ON THE LIABILITY OF STRICTURE PATIENTS TO A
RECURRENCE OF THEIR DISEASE.

IF there be one particular fact more than another upon which writers on stricture and surgeons in general agree, it is that those who have been affected with this disease are extremely liable to its recurrence. That although a stricture be fully dilated to the normal size of the urethra, yet, unless the use of the bougie be regularly continued for some length of time afterwards, the disease, except it be of short duration, will be likely to return. It may be as well to inquire upon what depends this unfortunate disposition to recurrence. Is the fault in the remedy, in any defect in its application, or in the natural tendency of the disease?

To use the bougie successfully, it is very desirable to understand, as far as possible, the precise manner in which it acts; and it will be useful to bear constantly in mind, that its action is of two very different kinds, the one mechanical, the other vital. The former, like the wedge, produces its effect by its distending power; the latter, by stimulating the absorbents to remove the thickened tissue, the essential part of the disease. It

is possible that, by the mechanical action of the bougie, a stricture may be fully dilated to the natural size of the urethra, and beyond this it is injurious to carry the dilatation; whilst, at the same time, the greater part of the disease itself, or that which is capable of a reproduction of the contraction, may still remain. The narrow way may, indeed, have been made wide, and thus one great object gained in having procured a free passage for the urine, consequently the removal of no inconsiderable source of urethral irritation. Yet there will be still much left to accomplish before the disease is cured. Until the thickened tissue be removed, neither the surgeon nor the patient will have much upon which to congratulate himself. The bougie will indeed have but half done its duty; and it is only by its continued use that we can hope for final success. There is surely no difficulty in comprehending why it is that strictures slowly dilated are less likely to return than when dilatation is more quickly accomplished. We cannot be much surprised at the almost certain return of strictures treated by retention of the catheter, when dilatation is usually effected in three or four weeks' time; more especially as, when thus treated, there is an additional reason for the recurrence of the contraction,—which is the injury done, more or less, to the urethral mucous membrane and adjacent parts, by long-continued retention of instruments, which, when withdrawn, leave an irritable inflamed surface, exposed to the passage of the urine, the pain during micturition being frequently so severe as to be compared by patients to the application of a hot iron. Of course, whilst the catheter is retained, the urethra is in a great degree protected from that source of irritation. In the treatment by retention of the catheter, the stric-

ture is merely stretched, and, as must naturally be expected, will contract again on removal of the distending power, as by far the greater part of the disease remains. In many cases thus treated, so quickly indeed does re-contraction take place, especially if dilatation have been rapidly effected, that on the following day after the removal of a full-sized catheter, it will often be impossible to pass one of half the size.

The lesson to be learned from these observations is this: that our treatment, to be successful, must not be confined to the mere dilatation of a stricture, but extended to the removal of the diseased tissue. How is the latter object best to be accomplished by the bougie? In the first place, the dilatation should be very gradually effected, bearing in mind that the vital action of the bougie is not its least valuable quality, to secure which it is especially desirable to avoid over-distension of the diseased tissues, absorption being best effected by a gentle pressure of the instrument. It appears to me that the most common cause of the return of a stricture is, that the thickened tissue, the essential part of the disease, has not been entirely removed. Another cause of a recurrence of the disease, but less frequent than the one just mentioned, is the existence of chronic inflammation, congestion, or perhaps mere morbid sensibility of the lining membrane at the seat of stricture, which often remains long after full dilatation has been accomplished. A patient, therefore, should never be considered cured whilst, on the introduction of instruments, the portion of the urethra in which the obstruction had been either feels harder than natural, or should the bougie when passing over that part, cause much increase of uneasiness. Persons under the latter circumstances are often liable to a gleet discharge on

taking cold, or from indulging in any excess. In this state I have often seen much benefit derived from the occasional introduction of a bougie, well smeared with mercurial ointment. It is best to begin with the ointment in the proportion of one part to three of lard, and gradually increase its strength. In some old chronic cases I have, however, at once used the strong mercurial ointment, with no other inconvenience than that of a sometimes rather severe smarting sensation of brief duration. It is very probable that the mercurial application may also have had some effect in promoting absorption of any remaining hardness, as well as in relieving irritation and inflammation. I am confident that this treatment, under the circumstances just mentioned, has succeeded in removing a disposition to gleet discharge when other means have failed. Mr. Guthrie, in his work "On the Anatomy and Diseases of the Urinary and Sexual Organs," which few surgeons can read without advantage, has recommended the application of his nitrate of silver ointment, composed of ten grains of the salt, one drachm of ung. cetacei, and fifteen minims of the liquor. plumbi diacetatis, to irritable spots in the urethra. His mode of applying the ointment will be seen in his work. When desirous of confining the application of the mercurial ointment to any particular part of the urethra, I use a common gum catheter, with a piece of thread round the stilet at its end, so as to fill up the instrument. The ointment is then inserted in the hole in the side of the catheter, the stilet, of course, having been withdrawn, and kept beyond that part until the seat of disease is reached, when the stilet must be pushed home. This is undoubtedly the best method of using Mr. Guthrie's

ointment to irritable spots of the urethra, as recommended by him.

When employing the mercurial ointment for the relief of irritation or inflammation, or to promote absorption, I generally use the common bougie, for obvious reasons. In cases of highly irritable urethræ, so frequently resulting from self-abuse, whether there may have been stricture or not, I have seen considerable improvement effected by an occasional introduction of a bougie covered with an ointment of one part of extract of belladonna to seven of lard. It has been previously stated that strictures treated by the potassa fusa were less likely to return than when the bougie only had been used. To secure so desirable an object, however, the application of the caustic potash must be continued until the whole of the thickened tissue be removed, which can be safely effected, except in cases where the stricture is of considerable extent, and of a cartilaginous hardness. Although, under the latter circumstances, the regular and long-continued use of the bougie will commonly, in a great measure, do away with the tendency to re-contraction, yet, in many instances, the use of the instrument cannot safely be discontinued during the entire life-time of the patient. I should, indeed, strongly advise persons who have had bad strictures always to be on the safe side, and not to be satisfied without the occasional introduction of a bougie, if only to assure themselves of their continued immunity from the disease. This is, however, a subject so all-important to those who have suffered from this most troublesome, and, when neglected, often fatal malady, that, to enforce the advice just given, I shall conclude this chapter by quoting the opinions of two illustrious

surgeons, of unrivalled skill and experience; the one long the boast of France, and whose warning words though now hallowed by the silence of the grave, are still echoed by nature's changeless voice; the other, the first of English surgeons, and happily yet living.

Dupuytren, when concluding his clinical lectures on the treatment of strictures of the urethra, observed: "That whatever care may be taken in the dilatation of strictures, the dilatation is but temporary in the greatest number of persons, and the contraction has always a tendency to return. This tendency to return has induced me to cause a bougie to be passed every ten, fifteen, or twenty days." Sir B. Brodie, in one of his clinical lectures on stricture, has given us the result of his great experience on this subject in the following words: "After a patient has conceived himself to be cured, and every symptom of the disease vanished, it is not an uncommon thing for him to suffer a relapse, and in all probability a relapse of far greater danger than the previous attack. From what does this arise? From his not continuing, at regular intervals, to pass the instrument, notwithstanding the disease should seem to have disappeared. It is the neglecting to do this which occasions so many obstinate cases of stricture. To pass it once in two or three weeks is enough, but it must never be thrown aside as useless during the life of the patient, if he desire to be freed from his troublesome affection."

CHAPTER XXXIII.

CONCLUDING REMARKS.

To avoid any misunderstanding of my views with regard to the treatment of stricture of the urethra, it may be as well to make a few summary concluding remarks.

Although the observations on the treatment of the more intractable forms of urethral obstruction by potassa fusa are more extensive than those relating to the method by dilatation, I trust it will be evident that their greater extent has not been caused by any intention to depreciate the latter ; but simply because the former is less generally understood by the profession. It has been especially my object to avoid advocating any one method of treatment exclusively. It cannot indeed be expected, that the surgeon who adopts a particular mode of treatment in all forms of urethral obstruction, will meet with the same degree of success as one who, having a variety of resources at command, is enabled to select such as may be most suitable to each individual case.

Dilatation will probably effect a permanent cure of stricture in its early stage, and before the occurrence

of much induration. That method, when properly conducted, will also prove successful in the relief of a great majority of strictures, notwithstanding the existence of much gristly hardness at the seat of disease. In such cases, however, there will be more or less tendency to re-contraction ; for, although the bougie may dilate the constricted channel to its healthy calibre, as indurated tissue is not easily removed by the absorbents, the obstruction will commonly return, unless prevented by an occasional introduction of dilating instruments, the use of which may sometimes be necessary during the entire life-time of the patient.

Caustic, when judiciously used, will often prove highly serviceable in facilitating dilatation ; and in many cases I know that the application of potassa fusa will be successful in the entire removal of indurated strictures, and in effecting a permanent cure of the disease. It is, however, in the treatment of impermeable obstructions that, in my estimation, consists the indisputable value of the caustic alkali, as it has enabled me to succeed in the relief or cure of many cases in which dilatation had failed after long trial in very skilful hands, where the only hope held out to the patients was perineal section, an operation which should never be resorted to but as a last resource.

With regard to the cases described as impassable, I may observe that nearly all of them before coming under my care had been treated by other surgeons, who had been unable to succeed in the introduction of any kind of instrument. I have therefore considered myself justified in employing that appellation, and in recommending the mode of treatment which has proved to me most safe and efficient in impermeable obstructions.

I allude to this matter, because it has lately been

contended by an eminent surgeon that all strictures are permeable. It is possible that they are so in his hands; and it is possible that I might have succeeded in passing instruments through strictures, which I have preferred to treat with the potassa fusa, more quickly, and, as I believe, more safely, and with permanent advantage. Strictly speaking, the terms permeable and impermeable, as applied to the large majority of bad strictures, mean only less and more difficult; and even supposing that there is no form or degree of stricture which may not be permeable by a few gifted surgeons, yet all rules of practice to be generally useful must be adapted to the many, and not to the exceptional few.

In the treatment of the complications of stricture, I have dwelt more particularly upon those which, from the frequency of their occurrence, appeared to me to be of the greatest practical importance, having restricted myself to a briefer notice of those which are more rare. Had I not done so, this work would have been extended to a greater length than seemed to me to be desirable in a treatise confined to "Urethral Stricture, its Complications and Effects."

THE END.

LONDON :

G. J. PALMER, SAVOY STREET, STRAND.

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