

A treatise on the urethra; its diseases, especially stricture, and their cure / [Benjamin Phillips].

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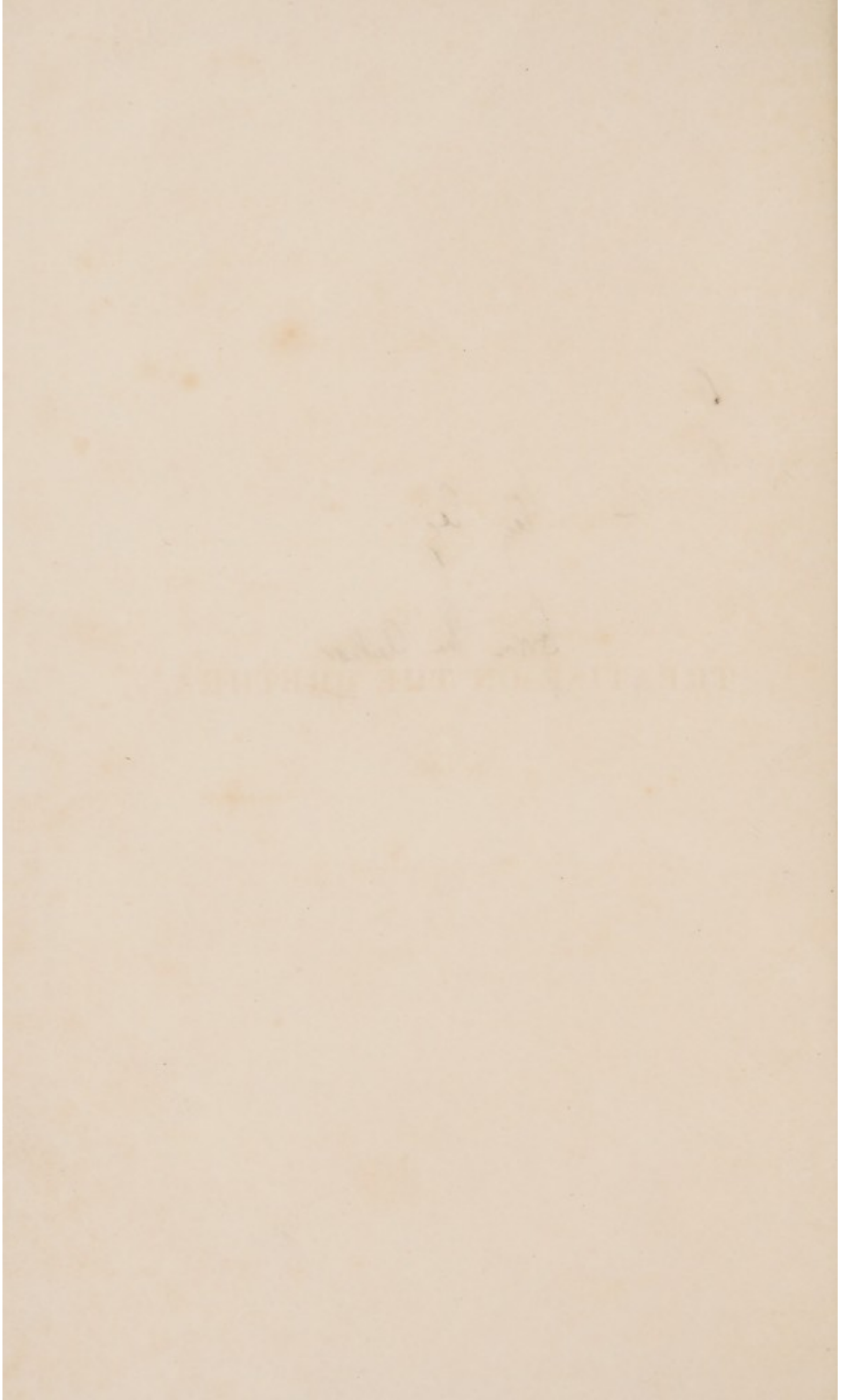
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from the Author



TREATISE
ON
THE URETHRA,
ITS DISEASES,
ESPECIALLY STRUCTURE
A

TREATISE ON THE URETHRA,

&c. &c.

BENJAMIN PHILLIPS,

LONDON,

JOHN WATTS, 10, BISHOPSGATE, AND WINGMAN,

FATHERSINGH, BOMBAY.

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OF

THE

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A
TREATISE
ON
THE URETHRA;
ITS DISEASES,
ESPECIALLY STRICTURE,
AND
THEIR CURE.

BY
BENJAMIN PHILLIPS,

AUTHOR OF A SERIES OF EXPERIMENTS MADE TO DEMONSTRATE THAT
ARTERIES MAY BE OBLITERATED WITHOUT LIGATURE,
COMPRESSION, OR THE KNIFE.

LONDON:
LONGMAN, REES, ORME, BROWN, GREEN, AND LONGMAN,
PATERNOSTER ROW.

1832.

TREATISE

ON THE HISTORY AND

THE URETHRA

310316

ITS DISEASES

ESPECIALLY STRICTURE



BENJAMIN PHILLIPS

Author of a Treatise on the Venereal Disease, with the Description of the
Gonorrhoea, and its Effects on the Urinary Organs, &c. &c. &c.
LONDON, 1812.

LONDON

ROGERS, BISHOPSGATE, GREEN, AND LONDON

LONDON

JOSEPH MALLETT, PRINTER, WARDOUR STREET, SOHO.

TO
SIR HENRY HALFORD, BART. K.G.H. F.R.S.

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS, ETC. ETC. ETC.

WHOSE DISTINGUISHED
SCIENTIFIC AND LITERARY ATTAINMENTS
HAVE JUSTLY PLACED HIM
AT THE HEAD OF THE MEDICAL PROFESSION
OF HIS COUNTRY,

THIS WORK
IS (WITH HIS PERMISSION) RESPECTFULLY INSCRIBED,
BY
THE AUTHOR.

17, Wimpole Street, Cavendish Square,

November 8, 1832.

SIR HENRY BAILEY BART. K.G.L. F.R.S.

Member of the Royal Society of Edinburgh, etc.

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1840

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P R E F A C E .

IN presenting myself at the bar of public opinion, I may be required to explain the motives which have led to the composition of the work now submitted to impartial criticism.

Diseases of the urethra are frequent in their occurrence, distressing in the sensation they occasion, and frequently fatal in their effects. Of all those diseases, by far the most distressing and alarming is stricture—often so serious in its consequences and always so harrassing in the anxieties it occasions to the patient as well as to the practitioner. Had not my opportunities of observing and treating these diseases been unusually numerous and favourable, I should scarcely have conceived myself justified in intruding my experience upon the world.

Stricture can be combated only by one of two modes—dilatation (which implies absorption of the morbid mass), or destruction: the former accomplished by the introduction of a foreign body into the urethra, which gradually (as the indurated matter is absorbed) accommodates itself to the increased size of the instrument employed, by which means its original capacity is obtained; the latter occasioned by the use of a chemical or mechanical agent—caustic or the knife.

The merit of the practitioner consists in the prudent selection of that remedy most applicable to each particular case. This is often a task of much delicacy, requiring for its successful performance a perfect acquaintance with the anatomy of the organ, the pathology of the disease, and the application and action of the remedies. Where, then, is the practitioner, whose opportunities of observing and treating the disease have been few, to acquire the information necessary to enable him to treat successfully difficult cases of stricture? Far be it from me to undervalue the Treatises of Sir Everard Home and Sir Charles Bell: the merit of those productions is indisputable; and the work of Sir Charles Bell, in particular, displays much of that calm reflection and philosophical investigation which distinguish the productions of that able and accomplished man: and, in mentioning the name of an individual to whom science is so much indebted, I may perhaps be excused for pausing to acknowledge the obligations I am under to my former Professor, and, I trust I may be allowed to add, my present Friend.

But each of those works was written to advocate an almost exclusive remedy, and partakes, therefore, of the defects and vices which exclusive systems in medicine must necessarily present. With Sir Everard Home cauterization, and with Sir Charles Bell dilatation, is the

remedy; and, although I am not disposed to pare down the value of either, the impartial reader will, I think, agree with me, that, in the majority of cases, dilatation would be worse than useless, whilst there are others where cauterization would be unnecessary and even imprudent.

I have endeavoured, in the following Treatise, to balance the merits as well as the defects of each, and to point out the circumstances which should govern the selection of either: that I have done this honestly and impartially, I know; whether I have done so with success, the public will determine.

An important, perhaps the most important, consideration in determining the merits of cauterization, is the question of the reproduction of mucous membranes—a question which the subject of the present Treatise has compelled me to discuss at some length. The time thus spent will not, however, have been misapplied, if it should contribute to the settlement of a question of considerable interest in medical as well as in surgical science.

In practice, the great objection to caustic has been the impossibility of confining its action to the diseased portion of the urethra only; whilst, in many cases, the orifice of the stricture is so small, that it has been found impracticable to introduce the caustic into its interior. I have ventured to recommend an instrument which, by

slightly incising the stricture, will, in every case, afford an entrance to the caustic ; whilst, by the use of the caustic apparatus, a diagram and description of which will be found hereafter, it may be applied with much precision to the diseased surface only.

Within the last few years an instrument has been introduced for removing the stricture by incision. Impressed with the value of this remedy, if so governed as to act upon the indurated part of the canal only, and at the same time convinced, by observation, of the danger which, in any even the most skilful hands, must attend the operation to which I have alluded, I have long and anxiously considered of the possibility of avoiding the objection to which that operation is at present exposed. With that view I have constructed an instrument by which I confidently submit that (under the circumstances which will be found described hereafter) stricture may be removed, without hazard or danger, and with which I have several times operated with the most entire success. At the same time, whilst there are cases where it may be wise to remove stricture by cutting, it is to cauterization, under the security afforded by the perfection and safety to which it has at present attained, that I look as the most decidedly valuable and frequently available remedy. We may, it is true, save time by cutting ; and cases occa-

sionally occur where this may be important; but I cannot conceal from myself the conviction that the action of the knife is as yet insufficiently controlled; and that we may, in an extreme case, whilst removing the diseased, injure the healthy portion of the urethra.

I beg, here, to express my obligations to Hunter, Home, Bell, Shaw, Desault, Chopart, Ducamp, Lallemand, Lisfranc, and Dupuytren; as well as to Andral, Gendrin, Villermé, and Cruveilhier: to the latter gentleman, in particular, I am indebted for much valuable pathological information. To any other writer, from whom I may have derived assistance of which I am at this moment unconscious, I beg likewise to make my sincere acknowledgments—feeling, as I do, that there is no species of property which should be held more sacred than the conceptions of the mind.

I now commit my little bark to the waters, with anxiety it is true, but with some self gratulation also. To a man embarked in an arduous profession, the fate of an appeal to that public upon whose patronage he depends is necessarily the source of anxiety; but whether success or failure attend him, it will be always a gratification to him to reflect that he has left no means untried to qualify himself for the task he has undertaken, and that he has endeavoured to perform it with honesty and impartiality.

ERRATA.

The following corrections are important, and should be made before the perusal of the book.

- Page 12 line 10 for "muscular fibres" read circular fibres.
- 23 — 7 for "casuæ" read casu ne.
- 32 — — the parenthesis should merely include "and in this case is equivalent to a proof."
- 32 — 8 for "of all the systems the mucous is that in which we most frequently observe the phenomena" read of all the systems the mucous is that in which the phenomena I have described most frequently occur.
- 88 — 24 for "lux" read lax.
- 116 — 2 for "Hunkemann" read Hahnemann.
- 148 — 17 for "contagious" read contiguous.
- 164 — 3 for "magniture" read magnitude.

THE URETHRA.

CHAPTER I.

ANATOMY OF THE URETHRA.

LENGTH; DIAMETER; DIVISIONS; PROSTATIC, MEMBRANOUS, AND SPONGY PORTIONS; ORGANIZATION; DIRECTION; DEVELOPMENT OF PROSTATE; AND CONTRACTILITY OF THE URETHRA.

LENGTH.

THE urethra is the excretory canal of the semen, of the prostatic fluid, and of the urine; it extends from the neck of the bladder to the orifice at the termination of the gland, passing above the inferior extremity of the rectum, and below the symphysis of the pubis.

Very discordant estimates have been formed of the length of this canal; some authors having stated it as low as seven inches and a half, and others as high as twelve inches. Whately, who carefully examined forty-eight subjects, divided them into three classes; those of high,

middling, and low stature; and these are the results :

HIGH.		MIDDLE.		LOW.	
Inches.	Lines.	Inches.	Lines.	Inches.	Lines.
1 ..	9 6	3 ..	9	1 ..	8 9
8 ..	9	1 ..	8 9	2 ..	8 6
5 ..	8 6	7 ..	8 6	4 ..	8
2 ..	8	2 ..	8 3	2 ..	7 9
		7 ..	8		
		2 ..	7 9		
		1 ..	7 6		

Giving as a medium 8 inches $4\frac{1}{2}$ lines.

The experiments I have made by injecting the erectile tissue composing the corpora cavernosa decidedly confirm the accuracy of Whately's calculations, and justify me in stating the average length of the urethra as varying from eight to nine inches.

The observations made by Lisfranc shew that, in several subjects examined by him, he found the urethra of the length of from nine to ten inches; and, in a negro recently dead of variola at La Pitié, of the length of eleven inches; a fact which is adduced by him in opposition to an opinion advanced by Rougier, "that the urethra is never more than ten inches in length." After the opinion I have already given, I need scarcely add that I decidedly agree with Rougier in as far as Europeans are concerned; but it has been long established,

that the genital organs, both male and female, in negroes, or at least in those of the country of the Boschisman, are much more developed than they are in Europeans*.

DIAMETER.

The diameter of the canal is a question of more importance than the length; for if we do not acquire accurate data on that head, we cannot hope for success in the treatment of stricture; it being evident that, unless we restore the canal to something like its natural calibre, we can never obtain a cure of the disease.

The only observations on the diameter of the canal which have been given to the world, are those of Home and Lisfranc. The observations of Home were made on two subjects, one of the age of from seventy to eighty, and the other of thirty; and the dimensions were found to be as follows:

	80	30
At $\frac{5}{4}$ of an inch from the orifice (at the gland) - - - - -	$\frac{9}{20}$	$\frac{7}{20}$
At $4\frac{1}{2}$ inches from the orifice, of the gland - - - - -	$\frac{7}{20}$	$\frac{7}{20}$
At 7 inches from the orifice (which was at the bulb) - - - - -	$\frac{12}{20}$	$\frac{13}{20}$

* Histoire Naturelle du Genre Humain, par J. J. Virey.

At $7\frac{1}{2}$ inches (which was the commencement of the membranous portion)	$\frac{7}{20}$	$\frac{4}{20}$
In the younger subject, at this part there was a stricture.		
At $8\frac{1}{4}$ inches (which was the termination of the membranous portion)	$\frac{9}{20}$	$\frac{7}{20}$
At $8\frac{1}{2}$ inches (which was the commencement of the prostatic portion) -	$\frac{7}{20}$	$\frac{6}{20}$
At $8\frac{3}{4}$ inches (which was the middle of ditto) - - - - -	$\frac{11}{20}$	$\frac{10}{20}$
At 9 inches (which was the neck of the bladder) - - - - -	$\frac{9}{20}$	$\frac{8}{20}$

In the twelve subjects examined by Lisfranc, the commencement of the spongy portion of the canal is described by him to be from five to six lines in diameter; an opinion which is not entitled to much weight, as he did not resort to actual admeasurement: from that point the canal seemed to him to diminish gradually to the fossa navicularis.

The observations I have made differ from those of Home only in making the diameter a little less considerable, whilst the relative diameter of the different parts was similar to that of the younger subject examined by him. The admeasurement procured by the injection of wax into the canal is uncertain; and I attribute the difference between the results of the experiments made by Home and those made by

me, to the different force used in propelling wax into the canal.

Immediately posterior to the bulb, where the membranous portion passes through the triangular ligament, the urethra presents a less capacity, by a line, than in any other portion, except the external orifice, which is still smaller by a line, and is from two and a half to three lines only in diameter.

The existence of the dilatation at the fossa navicularis is denied by Amussat, who states, that the urethra represents a cone, of which the base is presented posteriorly;—that it is slightly enlarged at the commencement of the membranous portion, and contracts as it approaches the bulb,—enlarging again suddenly at the commencement of the spongy portion, and afterwards diminishing insensibly to the meatus;—that there does not exist any enlargement in the situation corresponding to the gland, that is to say, at the fossa navicularis;—that the appearance of enlargement at this point is accounted for by the tissue of the gland being less soft, and the mucous membrane more adherent than in the other parts of the canal, the two moieties of the gland, being thus firm, remaining extended, while the spongy tissue, properly called, returns upon itself when empty of blood;—and that the non-existence of the fossa navicularis, except in appearance, is proved by the fact,

that, in extending transversely the spongy portion of the urethra, which is behind the gland, we give it the same size with that portion which is lodged within the gland.

I apprehend that Amussat's reasoning is characterized on this occasion more by ingenuity than correctness; for in the way he experimented, which was by removing the surrounding parts, he would find little difficulty in giving the urethra any form he desired: besides, in injecting wax into the canal, the tube would, according to his theory, be smallest in the gland from the increased resistance offered by its tissue; whilst, unfortunately for his deduction, the contrary is found to be the case: so that the extreme accuracy which usually distinguishes the observations of M. Amussat seems to have failed him on this occasion.

DIVISIONS.

The canal has been divided by anatomists into three different and distinctly marked portions. The portion immediately succeeding to, and continuous with, the neck of the bladder, has been named the prostatic portion; to that succeeds the second and smaller portion of the canal termed the membranous; and the third, or remaining portion, which extends to the termination of the gland, has obtained the name of the spongy portion. Some writers have desig-

nated a fourth, which they have named the bulbous portion; a distinction, however, which appears to be unnecessary.

PROSTATIC PORTION.

The prostatic portion, as I have already stated, is that part of the urethra immediately succeeding to the neck of the bladder, and terminating at the anterior portion of the prostate gland. Its length has been variously estimated by anatomists: thus, Boyer estimates it at from fifteen to eighteen lines; Ducamp, at twelve to fifteen lines; and Lisfranc, at eight to eleven lines. My own observations, made with all the accuracy of which I think the subject is susceptible, induce me to concur with Ducamp, in stating the variation at from twelve to fifteen lines. The direction of this portion of the canal is obliquely from above downwards and forwards.

This region of the urethra is in intimate connection with the prostate only in its inferior three-fourths; the superior fourth being in intimate relation to the arch of the pubis: and, if the urethra be removed and the tube be distended with air, this portion may be rendered perfectly diaphanous. Sometimes, however, this portion of the urethra is entirely surrounded by the prostate, especially when that organ is diseased; but, more commonly, the superior

fourth is enveloped by muscular fibres. The inferior portion of this region is supported on the rectum by means of cellular tissue, which is found here in considerable quantity, traversed by many blood vessels; and it is united to the vesiculæ seminales by means of a part of the recto-vesical aponeurosis. The floor of this region of the urethra presents an oblong body of the length of from seven to nine lines, which has been named the verumontanum, and which extends from the neck of the bladder, where it is largest, nearly to the extremity of the prostate, where it is almost pointed. An oblong, narrow furrow, corresponding to a mucous sinus, which has been named by some anatomists the sinus pocularis, is situated on the superior part of the verumontanum: on its sides are found the orifices of the ejaculatory ducts; on its surface, five or six to eight or ten excretory canals of the prostate; and, anterior to it, the orifices of the ducts proceeding from the glands of Cowper. On its sides are also sometimes found two culs de sac, occasionally very profound, in which sounds are frequently arrested. Lisfranc speaks of a preparation in his possession which exhibits a depression between the two lobes of the prostate, the antero-posterior diameter of which is two lines, its transverse diameter one line, and its depth one line and a half. This depression, al-

though rare, has been occasionally met with, and has been generally found at the right side of the verumontanum; in which case this organ is *deformed* and inclined to the left. As a sound may be introduced with much facility into those cavities, the practitioner should follow the inferior portion of the canal with great caution. Behind the verumontanum, we remark a transverse projection, which establishes a precise demarcation between the bladder and the urethra; and those two elevations, the verumontanum and the transverse projection, unite at a right angle and divide the commencement of the canal on its inferior parietes into two lateral moieties or fossæ, in which sounds are arrested still more frequently than in the lacuna upon the verumontanum.

If we pass the finger along the superior parietes, we find that it is not arrested except at the situation corresponding to the triangular ligament; and this may be explained by remarking, that the erectile tissue is so thin above, that the transition from the spongy portion to the membranous is insensible, at least not marked by any sensible demarcation. The demarcation between the urethra and the bladder is indeed so little marked at this point, that the finger glides easily and almost imperceptibly from one into the other.

In the pathological state, there must necessarily be many changes in this portion of the canal ; and the observations I have made induce me to state the length of this region, in that condition, at twelve to seventeen lines. Home states, that, in two individuals, one of the age of eighty years, the other of the age of thirty, he found the depth of this portion of the canal of the following dimensions, proceeding from before, backwards :—the first or anterior part was, in the first subject, four lines ; in the second, three and a half : in the centre—the first, six lines ; the second, five and a half : near the neck of the bladder—the first, five lines ; the second, four and a half. Lisfranc says he has found that the anterior, as well as the posterior part, is from three to four lines in depth ; the middle from four to five and a half. On Lisfranc's shewing, it would appear that the prostate represents two cones, applied by their bases almost at the centre of the gland ; and Amussat supposes that the elevation thus produced may, in some cases, present an obstacle to the passage of an instrument.

The minuteness with which I have entered into this description may be objected to by some of my readers ; but I think by no one who has duly reflected on the paramount importance of an accurate knowledge of this portion of

the urethra, and the frequent occurrence of those distressing diseases to which the canal is subject.

MEMBRANOUS PORTION.

The second and narrower portion of the urethra which succeeds to the prostate is distinguished by the term membranous; its form is cylindrical, and its length, like that of the other portions, has been differently estimated: by Boyer at twelve lines, by Ducamp at nine or ten, and by Lisfranc at seven to eleven. Much of this diversity may probably be attributed to the different points at which the admeasurement was taken. Its extent is not the same superiorly as inferiorly. Inferiorly, it is very short, limited in front by the posterior extremity of the bulb, and behind by the prostate; so that superiorly its length is about an inch, and inferiorly four or five lines.

The situation of this portion of the canal is directly under the symphysis of the pubis and the point of junction of the corpora cavernosa. Inferiorly, it is in immediate relation to the glands of Cowper and the acceleratores urinæ muscles; on the sides, it is in relation to the corpora cavernosa, separated from them only by a few muscular fibres, vessels, and nerves; and over this portion the triangular ligament is

said by some writers to send an aponeurotic envelope.

This region is stronger and thicker than is generally supposed, being much strengthened by the muscular fibres of which I have spoken ; yet it is often pierced by the beak of the sound. On elevating the muscular coat which surrounds the membranous portion, we find that here the urethra is organized almost like the bladder, containing longitudinal and muscular fibres in intimate union ; and that it is much less easily affected by insufflation than the bladder. Its direction is from behind forward and from below upwards.

SPONGY PORTION.

The next and terminating portion of the urethra has received the name of spongy, from being surrounded by erectile tissue, which has obtained that appellation. Its length is necessarily subject to much variety, dependent on the greater or less development of the penis. This portion of the canal commences at an enlargement called the bulb, and terminates at another enlargement called the glans penis. The estimates that have been given of its length have, for the reason I have stated, been exceedingly variable, the opinions of scarcely any two writers being in accordance on the sub-

ject; and whilst it has been stated by many as admeasuring from eight to ten inches, it will be found rarely to amount to, and scarcely under any circumstances to exceed, the former dimensions.

The bulb is very distinctly marked posteriorly; but anteriorly it offers no precise point of demarcation, being insensibly continuous with the spongy tissue, of which it forms a part. It is situated in front of the inferior extremity of the rectum, to which it adheres, by means of dense cellular tissue, above the acceleratores urinæ muscles. It offers on its superior portion a groove, which receives the urethra at this point, which is the most contracted portion of the canal. From the bulb to the gland, the urethra presents a nearly uniform and cylindrical cavity, which is enlarged in the interior of the glans; and this increase in the calibre of the canal has obtained the name of fossa navicularis; after this, its calibre lessens considerably, and it is terminated at the summit of the glans by an oblong orifice, the capacity of which is inferior to that of any other portion of the canal.

To point out a precise demarcation between the bulbous and the spongy portions of the urethra may be thought necessary; and we will describe the spongy portion as commencing at that situation where the urethra is en-

tirely surrounded by that erectile tissue which has obtained the name of corpus spongiosum ; for at the bulb the canal is merely superposed upon this tissue. The spongy portion is embraced by the corpora cavernosa, which present inferiorly a groove for its reception, and is intimately united to the corpora cavernosa by very dense cellular tissue and blood vessels. Inferiorly and posteriorly it is surrounded by the acceleratores urinæ muscles, and ultimately by the skin and common integument only. As I have already stated, this portion of the tube is surrounded by spongy tissue, which is however much more abundant inferiorly where it corresponds to the skin, than on the superior parietes of the canal.

ORGANIZATION.

It is not my purpose here to enter into any detailed account of the organization of this canal generally, but simply to lay before the reader the prominent features presented in the structure of the urethra. The organization is not similar throughout the canal ; the whole, it is true, is invested by a mucous membrane ; but, external to that membrane, differences exist in the several portions of the canal. In the prostatic portion, the urethra is separated from the gland of that name by a layer of cellular tissue, and by a fibrous tissue possessing considerable

density. In the second, or membranous portion, which is the thinnest and perhaps the most frequently pierced by the catheter (this portion of the canal being involved in the curvature of the urethra), a fibrous membrane, apparently a continuation of that which separates the urethra from the tissue of the prostate, strengthens the mucous membrane; and this portion of the canal is also fortified by the muscular fibres of which I have already spoken, and by the aponeurosis which is sent backwards from the triangular ligament.

The opinion which has been very current, that the membranous portion of the urethra was the least resistant part of the canal, has induced a pretty general belief that it was the most frequent seat of false passages. I have shewn that really this portion of the canal possesses much solidity; and I may state, that false passages are less frequent here than in the bulbous portion of the canal. The reason of this must be immediately evident: false passages are ordinarily made in consequence of the difficulty experienced in the endeavour to pass an instrument through the strictured portion of the tube. Stricture is most frequently seated at the point of junction between the bulbous and membranous portions of the canal; consequently the false passage will be usually anterior to this latter point.

The parietes of the spongy portion of the canal are principally formed by a spongy tissue, which has much similarity to that of the corpora cavernosa. This tissue commences in front of the membranous portions by that singular enlargement called the bulb, and soon surrounds the urethra on all sides. In front of the bulb, the spongy tissue becomes immediately much thinner; but afterwards retains the same thickness to the extremity of the corpora cavernosa, where it expands to form the gland.

The mucous membrane which lines the whole of the interior of this canal is continuous at one extremity with that covering the glans; and, at the other, with the internal or lining membrane of the bladder. It sends prolongations into the ejaculatory canals, into the excretory conduits of the prostate, and into the mucous sinuses of the urethra. Its colour, at the external orifice and in the fossa navicularis, is of a somewhat vivid red; in the rest of its extent, when we express the blood which distends the spongy tissue, it is pale. It is this membrane alone which forms the longitudinal replications that are presented when the penis is in a flaccid state.

DIRECTION.

There is no subject connected with the urethra or its diseases, a thorough acquaintance

with which is more indispensable to ensure safe practice, than the knowledge of the direction of the canal in a state of health, and its susceptibility to variation in a state of disease. I feel confident that I am not insisting too strongly on this point, when it is considered that the distressing complaints to which this delicate canal is exposed have, in numerous instances, been produced through ignorance of this subject on the one hand, and hardihood on the other.

The direction of the canal, when the organ is in a quiescent state, has been usually compared to the letter S; and this may be nearly correct when the bladder and rectum are distended: but when the penis is placed against the abdomen, there is found only one curvature, and this almost disappears when the bladder and rectum are undistended. If we place the penis in a direction nearly at right angles with the ideal axis of the body, and look at the urethra in that portion of its course which has not reached the symphysis of the pubis, it will be seen that it forms a curvature which presents its convexity inferiorly, and that, after arriving in front of the pubis, the direction of the canal presents a straight line. When the corpora cavernosa are healthy, if we bring the penis towards the abdomen, we may remove all curvatures with the exception of the first. In

order to attain this end, Amussat has recommended that the position of the penis should be such as to form with the axis of the thighs (the patient being in the erect position) an angle of forty to forty-five degrees. But it is necessary to indicate with precision the last curvature of the urethra, which this position of the penis cannot entirely efface, and to distinguish it in the healthy and in the morbid states.

The words used by some authors of the present day, "that the canal is straight, or almost straight," having left much uncertainty in the minds of practitioners, I have determined here to endeavour to shew the exact direction of the canal, confident as I am that the knowledge will be found of much utility in practice. On six subjects, examined under ordinary circumstances, and in a healthy state, the rectum and bladder being carefully emptied of their contents, the level of the most depending part of the prostatic region of the urethra was found to vary from three to five lines below the level of the most depending portion of the vesical orifice of this canal. The level of the most depending portion of the membranous region averaged nearly nine lines below the most depending portion of the vesical orifice,—and the distance between the vesical orifice and the point of the triangular ligament through which the urethra

passes was fourteen lines — that point being three lines inferior to the vesical orifice of the canal. From this admeasurement, it must be evident that, in the state of health, the last curvature is inconsiderable.

On two subjects, having hypertrophy of the prostate, which I had an opportunity of examining, though the bladder was much depressed in the pelvis, the level of the most depending portion of the prostatic region of the urethra was found from six to seven lines and a half below the level of the internal orifice of this canal. There can be no doubt that like variations would be frequently found if new and extended researches were made on the subject ; but these observations alone are sufficient to shew, that, in sounding, it is necessary at this point to elevate more or less the beak of the sound.

In children, the canal undoubtedly presents a greater curvature ; for, in infants, the small capacity of the pelvis does not admit of the descent of the organs which at a later period it is destined to contain. As its development increases, these organs are more completely contained in the cavity of the pelvis, and the canal has then a tendency to approach to a straight form. One circumstance which tends to shew that the urethra is or may be made nearly straight without difficulty, is, that little pain is

experienced by the introduction into the canal of a straight instrument : indeed, we find, that, even when curved instruments are employed, frequently the whole of the curved portion has been passed into the bladder—and that all that remains in the canal is straight.

If the bladder and rectum be full, the bladder becomes elevated, and the direction of the urethra necessarily changed. When the bladder is empty and the rectum full, the subpubic curvature is as much greater as the intestine is more distended ; the curvature is then much greater than when both organs are full, as in the latter case the weight of the bladder tends to prevent its ascent. The position of the patient materially influences the direction of the urethra, and more especially that portion in front of the symphysis. When the patient is standing, or lying perfectly horizontal, the anterior walls of the abdomen become more tense, and in consequence thereof the suspensory ligament of the penis applies that organ more closely to the symphysis, and it is depressed with more difficulty. Thus in its three anterior fourths, the urethra is a flexible canal—a disposition which allows of our giving it three principal directions. In the first, we elevate the penis upon the abdomen, and describe a curvature, the concavity of which is directed upwards, the centre corresponding to the inferior part of the

symphysis of the pubis: in the second, by depressing the penis, we describe, in its anterior portion, a curvature almost the reverse of the preceding: and, in the third, by placing the penis in a position intermediate to the two preceding, the urethra becomes nearly straight, and we may almost accommodate the canal to the instrument.

I must not be understood to maintain that the urethra may be made really straight, but that it may be rendered so nearly so as to admit without difficulty a straight instrument.

DEVELOPMENT OF THE PROSTATE.

Before I terminate this chapter, I may be permitted to say a few words on the development of the prostate, as established by Serres; because it may serve to throw some light on a subject which has given rise to much discussion: I mean the existence or non-existence of a third lobe, so strongly insisted on by Sir E. Home, and previously noticed by Morgagni*. Though

* *Vesicæ autem pariete anteriore secundum longitudinem discisso, in oppositi ea parte quæ proxima orificio est, in ipsoque hujus partis medio, se obtulit protuberantia subrotunda, mediocris uvæ acini magnitudine, intima tunica vesicæ obducta: quam, ratus quod erat, scalpello adacto simul ipsam, ac contiguam prostatam in longum dissecui, ostendique, ejusdem esse atque ea glandula naturæ, cum eaque manifestissime continuatam, nihilque esse dubii, quin, si majis excrevisset,*

the prostate does not actually constitute an essential part of the urethra, yet its connection with it is so intimate, and the question appears of so much importance, that I shall briefly describe the phenomena of the development of that organ.

Primitively, in the human embryo, we do not find the prostate; neither do we perceive it until the termination of the second month. At that period it is formed of four lobes; and this multilobular division corresponds to that of other organs in the embryo, as the kidneys, &c. From the fourth to the fifth month, the two posterior lobes unite to form one, the prostate at this period appearing to consist of three lobes; and from the sixth to the eighth month, all these lobes unite and form, as in the kidney, a unique organ, which embraces the origin or a part of the origin of the urethra; yet by an attentive dissection we may discover, as in the kidney, traces of the primitive organization*.

*magno urinæ futura fuisset impedimento.—Morgagni de Sedi-
bus et Causis Morborum.—Epist. 41, No. 18.*

Adjungere huc poteris senem illum medicum, quem altera ex indicatis apud Vallisnerium observationibus totam quidem prostatam habuisse tumidam monstrat, sed auctam quasi lobo quodam et sua ipsa glandulosa substantia, quæ ad nucis juglandis formam et magnitudinem intra vesicam ascende-
bat.—*Epist. 42, No. 19.*

* Si ea quæ ex sepulchreto exempla indicavimus, et id

It is evident, then, that if the union of these three portions be, under any circumstances,

quod supra ex Valsalva attulimus, et nostra omnia attente inspicias ; cuncta in senibus fuisse animadvertes ; item nostra omnia in quibus carunculæ initiam fuit, hanc in medio ipso posteriori interni summique glandulæ ambitus excrescentem obtulisse casuæ hæc cuncta, an secus, futuræ ostendent observationes. Interea adjungere huc poteris senem illum medicum, quem altera ex indicatis apud Vallisnerium observationibus totam quidem prostatam habuisse tumidam monstrat, sed auctam quasi lobo quodam ex sua ipsa glandulosa substantia, quæ ad nucis juglandis formam, et magnitudinem intra vesicam ascendebat, non ab anteriore, sed ab ea parte cui rectum adjacet intestinum.

Illa tamen quoque, in adversariis memorata, ejusdem glandule subrotunda propago, nisi quod ab externo ambitu se extollebat, et secundum naturam ad huc esse visa est, illa inquam, medium pariter posteriorem summumque locum tenebat. Cæterum hæc que præter naturam sunt, interiores hujus glandulæ excrescentiæ, non simplices semper, sed et duplices non nunquam sunt cujusmodi illa erant a Thoma Bartholino patavii deprehensa *ex substantia glandulosa et candida* intra vesicam *tubercula bina, forma, et magnitudine testium*, æqualiter se supra foramen volventia, quæ cedebant syringæ immissæ, sed statim recidebant in pristinum locum, illa extracta, quæ admodum in sectione hac sepulchreti habes 24. Quæ bina tubercula nunquam Terraneus pro Cowperi glandulis, quas suas credebat, tumefactis accepissat, si Bartholenium legens, in vesica reparta esse animadvertisset, non legisse autem, atque hunc utinam tantum ; verisimile est cum observationum unde cogendarum, et transribendarum studiosus, hanc Bartholini haberi, *cent. 1, hist. 23, quæ cent. habiter 2, hist. 52*, verum si ea tubercula excreverant, ut eorum natura,

arrested, there may be presented a posterior and middle portion, which may be termed a middle lobe.

When suppuration attacks those organs which originally present a multilobular character, and which afterwards, during the progress of organization, lose that character and assume the appearance of unique organs, it is found that its ravages are at first directed to those points which were last formed; and when their destruction is effected, the organ again presents its multilobular character. This often occurs in the kidney; and it is to a similar phenomenon that I refer the occasional appearance of the "third lobe" of the prostate, which is very rarely demonstrable, except during a pathological condition of the organ.

The more the two small lobes are separated, the less sensible is the verumontanum; and it is not until after their union that this projection has place; nor does it acquire its full dimensions until near the epoch of puberty, when the development of the ejaculatory ducts becomes more marked.

color sedes indicant, et duo, alias a me tibi descripta, proportione ostendunt; si excreverant, inquam, ex prostata glandula; mihi recens quoque exemplum est glandulæ hujus in duas intra vesicam carunculas procrecere incipientis.
—*Morgagni de Sedibus et Causis Morborum.*—*Epis.* 42, *No.* 19.

CONTRACTILITY OF THE URETHRA.

One more point which I will notice here, is the question whether the urethra be contractile in front of the membranous portion; and whether it be, in virtue of its elasticity, susceptible of reaction on bodies which traverse it. It is certain, if we inject a liquid into the urethra, and at the same time compress the gland, that, when the pressure is removed, the liquid is expelled to a distance equal to that to which the urine is ejected by the action of the accessory organs; and it is equally certain, that, in those persons who have suffered amputation of this organ, the urine is scarcely ejected beyond the dress. It is also clear that the urethra reacts strongly upon instruments or injections which are introduced into the canal; and we may therefore, I think, assume the affirmative of both positions.

CHAPTER II.

PATHOLOGY.

OF MUCOUS MEMBRANES IN GENERAL, THE GENITO-URINARY SYSTEM IN PARTICULAR; INFLAMMATION, ACUTE, PSEUDO-MEMBRANOUS, AND CHRONIC; INDURATION; REPRODUCTION OF MUCOUS MEMBRANES.

HAVING completed the anatomical description of the urethra, I shall proceed first to describe the usual character of mucous membranes in a state of health, and then to consider the diseases to which they are subject, and the alterations those diseases produce in their structure and functions.

DEFINITION.

I understand by mucous membranes the class of humid integuments that invest the canals, cavities, and hollow organs which are in communication with the exterior, and which are lubricated by means of a mucous fluid secreted by the cryptæ contained in the membrane and deposited on its surface.

These membranes do not present, in all the situations in which they are found, an uniformity of organization, but are specially modified for the performance of the different functions to which they are destined. Like the skin, they present an adherent and free surface: the adherent or external surface is generally in contact with a peculiar layer of cellular tissue, to which Ruysch and many other eminent anatomists have given the term nervous membrane, which Albinus and Haller have named cellular tissue, and which Bichat has denominated submucous cellular tissue, which appears to me the most characteristic appellation. The tissue is rather dense, fibrous, and whitish, and never contains fat: and it is to it that the hollow organs owe, to a great extent, their solidity. The free surface of mucous membranes presents depressions of many kinds; but these are not equally apparent in all its extent: they exist at their maximum of development in the second stomach of ruminating animals. The follicles or cryptæ differ little from these depressions: they have a narrow orifice, an elongated neck, and an enlarged fundus; they are lodged in the submucous tissue into which they project. They are formed of prolongations of the mucous membrane, and are supported by the cellular tissue by which they are surrounded. Their number and volume are subject to much

variation. Some are simple ; others open into a common canal ; others empty themselves into a common, dilated orifice, called a lacuna : such is the hole at the base of the tongue, those of the urethra, rectum, &c. In certain situations the cryptæ are aggregated together ; at other times they are scattered over the surface of the membrane ; but they are generally found agglomerated around the orifices of the excretory canals.

Those membranes derive their name from the fluid secreted by the cryptæ or follicles which are found within the substance of the membrane, or external thereto. This fluid is viscous, transparent, insoluble in alcohol, soluble in the acids, and precipitated from its solution by the acetate of lead. When the mucous secretion is augmented, the membrane is reddened, and its thickness is so much increased as to be frequently found double or treble its natural dimensions : the follicles then become much developed ; they appear rounded, and present, at the surface of the membrane, projections which produce in it a rugous appearance. Such is the state of the membrane after an augmentation of secretion without inflammation.

It cannot be necessary for me to enter into a minute description of the various characters possessed by those membranes in the different situations in which they are found. Every one is

aware of the difference between the conjunctiva and the membrane covering the nasal fossa ; between the membrane of the mouth and that of the trachea ; between the membrane of the stomach and that of the urethra ; and I shall therefore confine myself to a detail of the character of the membrane as existing in the urinary system only.

The membrane lining the genito-urinary system is continuous externally with the skin, at the apex of the gland, in man, and at the surface of the labia majora in woman. At its origin, in man, the membrane is very thin, is adherent by the intermedium of a compact cellular tissue, and is covered with conical papillæ ; but cryptæ are not found here. If the membrane be followed into the urinary canal, until we have passed the fossa navicularis, where it is distinguished by its redness, and by a great number of mucous canaliculated lacunæ, we see it, in man, gradually lose its red colour as we approach the bladder. In the whole course of the urethra, it is smooth and of a dense texture, and presents numerous lacunæ, of which I have just indicated the existence in the fossa navicularis which were first particularly examined by Mery in 1684 ; by Duverney in 1700 ; and, with great exactitude, by Laurent Terraneus in 1729* ; but which were first accurately de-

* Terraneus, de Glandulis Universim et Specialim ad urethram Virilem Novis, p. 3, 50, 51.

scribed by Morgagni. In the bladder, the mucous membrane is white and very spongy; it presents a great thickness and numerous cryptæ, yet it is little resistant, and is easily destroyed: in the ureters, it loses much of its thickness, acquires more density, and becomes smooth and white; and it is here impossible to demonstrate the existence of mucous cryptæ: arriving at the kidneys, it becomes, in the infundibulum, still thinner, is more spongy in the calices; but, upon the mammillæ, is so thin that it cannot be demonstrated.

Having described, I think, sufficiently in detail, the characters presented by mucous membranes generally, and those of the genito-urinary system in particular, I shall now point out the phenomena connected with inflammation of this tissue, to which, in my opinion, stricture may be always attributed.

INFLAMMATION.

By inflammation I understand that succession of phenomena occurring in a tissue, and produced by an irritation, of whatever kind it may be. They are super-excitation of the vascular system, succeeded by an enlargement of the vessels, and a certain stagnation of blood in their cavities. This congestion or semi-stagnation is produced as soon the circulation (at first accelerated) begins to relent. Once

produced, it may occur, that, by the force of impulsion which serves to produce it, the capillaries may be ruptured: there is then extravasation. At other times, this fluid is deposited in the substance of the tissue by a true exhalation; so that there may be, according to these two modes, extravasation of blood, or serum, fibrine, or pus. This infiltration, which is affected in the interstices of the tissue, adds to the irritation produced by the vascular congestion; it increases the sensibility, and produces a tensive pain.

This state, so complicated in appearance, termed inflammation, I reduce, then, to three morbid modifications—vascular super-excitation, vascular congestion, and interstitial infiltration. These are its elements, and they are narrowly connected the one with the other. This state is characterized principally by a redness; by an increase of temperature; by a tumefaction; and by an augmentation of the sensibility of the tissue. Redness, heat, pain, and swelling, such are the characters of inflammation.

Of these four characters, redness is the most unvariable; but, as we cannot establish, during life, its existence in those tissues which are removed from our view, it would be almost impossible to detect a great number of inflammations without examination after death, and

comparing the symptoms which have been observed with the disorders which we meet—did we not conclude from analogy (and in this case it is equivalent to a proof, from the existence of the symptoms which have been observed), that an internal inflammation exists.

Of all the systems, the mucous is that in which we most frequently observe the phenomena I have described ; and it is in this tissue that they are least observed. Continually in relation with external objects—submitted to influences of the most varied character—endowed with extreme excitability, in consequence of the numerous vessels and nerves which traverse it—the seat of the principal phenomena of life, such as those of digestion and respiration—these membranes play one of the most important physiological parts in the animal economy.

There can consequently be no difficulty in conceiving that they should be the seat of numerous irritations ; and it is so. The affections of this system form, certainly, five sixths of the diseases which afflict the human species. They possess, however, one singularity—in any portion of these membranes, the pain accompanying inflammation never acquires that intensity which it does in similar affections of cellular, serous, fibrous, or even osseous tissues ; it is, in general, dull and heavy, and often scarcely felt if the organ be at rest.

Besides the four phenomena common to all inflammations, and modified only by diversity of tissue, it has others which are peculiar to it; the inflamed surface is at first dry, and, if liquids are placed upon it, they are rapidly absorbed. Soon (the time, however, dependent on circumstances), mucus, of a limpid, serous, and sometimes acrid character, is secreted; its consistency augments; it becomes opaque, whitish, milky, then diminishes gradually in quantity and consistency as the inflammation abates. Such are the phenomena ordinarily observed in inflammation of mucous membranes. Examined after death, we find the points which have been affected, red, varying from rose to brown; and this colour is either uniform, pencilled, or pointed. The membrane is rugous, thick, and has lost much of its cohesion. The other effects are ulceration, hæmorrhage, vegetations, cancer, or gangrene.

Of all inflammations, those of the mucous membrane are in general those which excite the greater number of sympathies, and which most promptly and most powerfully affect the heart, the brain, and the animal heat. These sympathies are varied according to the portion of the system occupied by inflammation; and by this means their differential characters are distinguished.

The first change produced in mucous tissues

by inflammation, is a redness, which varies from a rose colour to a dark brown ; from the slightest and most superficial arborisation to the darkest spots, occupying the whole thickness of the membrane. By pressure, the natural redness, as well as that dependent on congestion (which is never completely uniform) is rendered pale ; but it has no such effect on the colour produced by inflammation ; neither does that disappear after death, or a prolonged maceration. Congestions, on the contrary, which are so frequent in these tissues, in consequence of the great number of vessels that they receive, disappear after a short maceration, and frequently by a simple washing of the membrane. The surface of these membranes becomes, in a state of inflammation, slightly rugous, especially when they possess papillæ.

Inflamed mucous membranes are almost always thickened. This augmentation, which is observed as soon as the redness appears, and which sometimes even precedes it, seldom arrives at its greatest extent until the vascular congestion has become very intense, and the tumefaction is proportioned to the vascularity of the membrane, and to the number of follicles contained in or below its substance. Its density is augmented by the presence and development of inflammation,—and the inflamed membrane

may be easily detached from the surfaces which it invests. The facility of separation is, however, variable, according to the natural thickness of the tunic, and to the structure of the cellular tissue, by means of which it adheres; the inflamed portions lose much of their diaphanous character, even when the redness is inconsiderable; and when it has become intense, the opacity is complete. At the commencement of the inflammation, the secretion of the membrane becomes more abundant, and loses in a great measure its viscosity; if the inflammation make rapid progress and become intense, the secretion diminishes in quantity, becomes less limpid and quite viscid; and when the inflammation has attained its greatest height, the secretion almost ceases, but soon returns—this extreme degree of inflammation being of short duration.

The question may here be asked, do the appearances of acute inflammation, so evident during life, disappear after death? If this ever occur, it will be undoubtedly in the conjunctiva, which, under certain circumstances, reddens and becomes pale so rapidly. The facility of ascertaining at any instant the state of the conjunctiva, has induced some persons to make the necessary examination of this membrane; and the result appears to be, that

death does not cause the disappearance of even the first inflammatory alterations. Other examinations have been made upon membranes occupying other situations; and the result of those examinations is, that the redness of mucous membranes, when it has passed the first degree (in which it consists of compact arborisation only), does not disappear after death.

The experiments of Gendrin shew, too, that in a state of inflammation absorption is not performed by mucous membranes. He placed in contact with the conjunctiva, pituitary and vaginal membranes of many animals, previously inflamed by the application of tincture of cantharides or of boiling oil, the extract of nuxvomica, and prussic acid, and failed to poison them; whilst the application of the same substances on the healthy tissue always produced death. The same experiments have been performed with caustic poisons; and the phenomena of poisoning did not commence until the poison had destroyed (by cauterisation) the inflamed mucous tissue. Having stated the characters of inflammation in mucous membranes generally, I shall describe more in detail the phenomena of that disease when situated in the genito-urinary system.

It does not appear that the portion of mucous membranes which invests the ureters

becomes much thickened in acute inflammation, no mention being made of any case in which the ureters had been obliterated by inflammation of this membrane. The mucous membrane of the bladder is, in acute inflammation, thickened in a very remarkable manner: naturally spongy, it appears still more so in a state of inflammation, becomes very humid, is infiltrated either with blood, mucous or a muco-purulent fluid, and may be detached with much facility from the subjacent tissue. A purulent mucosity of a very viscid nature covers the internal surface of the inflamed bladder. During the progress of the disease, the tissues of this organ are considerably thickened, appear more dense to the touch than when in health, and their tenacity is lost. It is to this circumstance that the fragility of this organ in a state of inflammation must be attributed. The membrane which lines the urethra becomes also, when inflamed, of a more or less vivid red colour, according to the intensity of the inflammation—the secretion of fluid increasing as the disease advances. The cellular tissue by which the mucous membrane adheres is not particularly dense, except on the surface of the prostate; and that, too, occasionally becomes infiltrated. If, therefore, the inflammation be very intense, the result will be a more or less complete obliteration of the canal of the

urethra and a more or less perfect retention of urine.

Having concluded the observations which I deem it necessary to make here on acute inflammation, before I enter upon the subject of inflammation of a chronic kind, I shall advert shortly to the formation of pseudo membranes.

PSEUDO MEMBRANES.

These productions are dependent, in the greater number of cases, on the intensity of the inflammation; and yet they have been occasionally remarked in all the different stages of this affection, as well where the inflammation has been of the slightest kind, as where it has become gangrenous from its intensity. In this inflammation, the affected membrane is red, injected, and slightly thickened; the cryptæ are more apparent, and the papillæ redder and more developed than in a state of health; the subjacent cellular tissue is infiltrated and friable; but the mucous tissue is not generally found so brown and tumefied as in the other acute inflammations. Those false membranes appear at first to be merely a coat or layer of viscid mucosity, of a greyish or yellowish white colour: this augments rapidly in consistency, and adheres to the inflamed membrane upon which it is formed—its circumference being

gradually terminated in a more or less puriform mucosity.

Much difference of opinion exists on the question, whether or not those pseudo membranes acquire organization—a subject into which it is necessary some enquiry should be instituted here; for upon the conclusion we may come to, will depend the opinion we shall form as to the effect of those membranes in the occasional production of stricture. The advocates for the affirmative of the position are Albers (who, taking the membrane of croup as his foundation, states that, in the museum of Soemmering, are specimens the vascularity of which may be demonstrated), Cailleau, Villermé (who thinks it is to an organization of the false membrane in croup, which survives beyond the disease that gave it birth, that we should attribute the changes that occur in the voices of some individuals who have been affected with that disease).

Their opponents are Guersent, and Gendrin (who says he has seen, on the false membrane of croup immediately attached to the trachea, small striæ resulting from a slight hemorrhagic exudation, but that, in a false membrane proceeding from a mucous surface, he has never seen the slightest vascular lineament, though during six years he had lost no opportunity of seeking it). Now, although in the present day such an organ-

ization of these pseudo membranes is believed scarcely ever to have place, the evidence already adduced establishes, as is submitted, the possibility, but the extreme rarity, of their organization.

When the false membrane is formed, if the inflammation diminish in intensity, we find, secreted between the membrane and the mucous tissue, a very liquid, greyish mucus. When the inflammation has entirely disappeared, the pseudo membrane is mobile, soft, mucous, and easily separated from the tissue upon which it is placed. The separation of the pseudo membrane is facilitated by the mucus secreted between it and the tissue; and when the separation is completed, the alterations caused by inflammation are effaced. Chaussier was the first to establish the truth of the separation of the false membrane as the inflammation diminishes. If, says he, the inflammatory irritation cease, the parts are not slow to resume their former disposition, and the membraniform layer, which was formed at the surface, is detached and rejected entire, or in shreds, according to the action and structure of the organ (and here it may be remarked that the separation would not have place if the false membrane were organized). A contrary course, however, to this occurs in serous membranes, in which these concretions become organized, and con

tinue to exist after the termination of the inflammation.

Although we have very little evidence to shew that pseudo membranes are produced in the genito-urinary system, it is not probable that system is exempt from the affection. I am aware of only very few cases which establish the existence of pseudo membranes in the genito-urinary system: one is cited in the *Journal Général de Médecine*, vol. 68, page 206, and was transmitted by M. Destrees, a physician at Vailly, to the Society of Medicine at Paris. In that case the individual who was affected with cystitis and intestinal inflammation expelled by stool a portion of false membrane, so extended as to alarm him, believing he had voided his intestines; he at the same time passed his urine with much pain, and with it a thick mucus mixed with considerable portions of membraniform concretions or pseudo membrane.

CHRONIC INFLAMMATION.

This disease constantly produces in the membranes of the genito-urinary system a more abundant secretion of mucus than is furnished by them when in health. The mucus, too, becomes greyish and more viscid; and, when the inflammation acquires intensity, a serous exhalation, sometimes in considerable quantity, is

frequently united to the mucous secretion. This exhalation, which is not observable in chronic inflammation of a moderate character occurring in these membranes, varies according to the variations in the intensity of the disease. These membranes, when affected by chronic inflammation, are, in the earlier stages, of a more or less uniform livid red colour. If the inflammation be little violent, and especially if of long standing, the redness is little marked, and sometimes ceases to exist, the membrane becoming altogether pale. The inflamed membrane is augmented in thickness, and possesses a texture more compact, and an appearance more homogeneous, whilst the surface, always rugous, presents to the touch a hardness and density which do not exist in the healthy state. When the inflammation is inconsiderable, the cryptæ are augmented in volume, and their tissue is indurated. If, however, the inflammation has been of long duration, the cryptæ are no longer apparent, but are confounded with the subjacent cellular tissue in the homogeneous texture of the thickened and indurated membrane. Where the inflammation is little intense, and of long standing, there only remain a thickening and slight injection of the tissue. In chronic inflammation of mucous membranes, the redness, the thickening, and the increase of den-

sity, are so combined that we scarcely ever observe the two latter characters in the absence of the former.

There are sometimes formed, on the surface of a mucous membrane affected with chronic inflammation, red vegetations, unequal, rugous, and rounded or flattened. These excrescences are seldom observed whilst the disease is intense and the vascular injection considerable. They appear to be a deposition from small vessels, and are surrounded by a tissue at first reddish and gelatiniform, but which becomes greyish, dense, and indurated, in proportion to the period of the continuance of the inflammation. I place *this* as a probable origin of those "fungi," or "carncosities," which are described as being occasionally developed in the mucous membrane lining the urethra, and tending, as they increase in bulk, to interfere materially with the excretion, if not to produce actual retention of urine. From the rarity, however, of their occurrence, or rather from the small number of cases in which their existence has been demonstrated, it may be questioned whether they do not owe their existence to a peculiarity of constitution modifying the character of a common affection. The existence of those productions has been questioned by men of great experience; but if we look to the authorities in support of their existence, there can be little reason for suppos-

ing that they are not occasionally found. Galen, Van Swieten, Astruc, Col-de-Villars, Daran, Antoine Pascal, Morgagni, and Petit (the latter of whom, in the examination of thirty urethras affected with disease, discovered those carnosities only in one instance), contend for their existence; whilst Sharp, Bell, Desault, Hunter, Baillie, Chopart, and many others, have expressed doubts whether they have ever been met with; yet a single positive testimony of their existence is amply sufficient to remove these doubts. In the month of June 1831, during a post-mortem examination made at l'Hôpital des Veneriens upon the body of a woman, these vegetations were discovered in the urethra.

I cannot conclude this article without directing attention to the small number of cases that are recorded, in which examinations after death have enabled us to state more particularly the changes which have been produced in the genito-urinary system by chronic inflammation. Lecat mentions a case in which the patient was forty-seven, of a robust constitution, subject, from the age of twenty-five, to difficulties in urining, which only occasionally occurred, and which were accompanied by attacks of melancholy. Lecat saw him, and relieved him many times by the introduction of a sound, between 1735 and 1741, when the disease disappeared, and there supervened pains at the shoulders and

divers other regions. In 1746 the patient made a journey to Paris upon a bad horse, and the old malady reappeared. In 1747 he suffered more than ever from it; and, having surrendered himself into the hands of quacks of all kinds, the disease assumed a serious aspect. Thirteen days before his death, Lecat sounded him, and the little urine that escaped by great efforts which the patient made, as well as that which was removed by the catheter, was mixed with pus. For some time previous to his death the patient had suffered much from hemorrhoids; and, at the periods when these occasioned him the greatest annoyance, the bladder became tranquil, whilst the bladder caused him much pain when the hemorrhoids ceased to annoy him. The patient having died on the 9th of February 1748, an examination was made. The abdomen being opened, a bladder of moderate dimensions was discovered, but the ureters were distended to the size of the finger, being eight or ten times their natural dimensions. The bladder was filled with a purulent fluid, apparently composed of equal parts of pus and urine, and there was no ulcer, or fungus, in the body or neck of this organ: the interior of the bladder was covered with bands (thrown out from the sides), and forming cells; these bands being merely an increased development of the muscular fibres. The villous membrane was

covered with red spots, the parietes were engorged and were an inch in thickness; the neck of the bladder, as well as the prostate, was healthy. There was at the bulb of the urethra a small excoriation, which Lecat regarded as having been produced by the introduction of the sound; and the kidneys were healthy, as well as the ureters, though dilated, from the retention of urine in the bladder.

The greater part of the authors who have treated of strictures of the urethra have neglected the anatomico-pathological researches indispensable to determine their character. They appear to have supposed the nature of the disease known, and have simply proposed modes of treatment: yet, if we enquire into the actual state of the science, with regard to this disease, we shall find that we are unable to discover, in any author, anatomical observations distinguished by an accurate description of the phenomena which had been presented*.

I shall here, too, introduce the observations made by Gendrin on two persons who died of

* M. Lallemand, who has often dissected urethras affected with stricture, says—"I dissected the urethra of a patient who was admitted into the hospital to be treated for strangury, but who died in two days after of a spontaneous perforation of the stomach. I found at the subpubien curvature a stricture which scarcely admitted the smallest sound. The canal, split in all its length, presented in the strictured por-

other diseases, and of whose history, during life, he knew nothing. Of the first, aged sixty, he says, "the membrane is healthy from the fossa navicularis to the bulb; behind the bulb it is of a greyish brown in the extent of four lines, and as if strangulated; its tissue appears only slightly indurated; but it adheres immediately to a thick and very dense, indurated coat of ho-

tion, a circular thickening of the mucous membrane, commencing and ending in an insensible manner; so that the section represented a "fusee" divided after its greatest diameter. The external border was not less swollen than that which corresponded to the surface of the canal: thus the cylinder, which formed the obstacle, thinned at its two extremities and enlarged at its middle, did not project less outwards than inwards. In dissecting the mucous membrane, I found it so strongly adherent at the altered point that it could not be removed entire: this proves that the cellular tissue, which unites these parts, had participated in the affection with the mucous membrane. The altered tissue was of a yellowish white, firm, resistant, little elastic, and easily destroyed: it did not present any appearance of distinct fibres; indeed we could distinguish an albuminous substance deposited in the cells of the mucous and subjacent cellular tissue, as in a sponge. I cannot give a more exact idea of this cylinder than by comparing it to that which is formed by the ossification of the periosteum around a fractured long bone, when the periosteum is tumefied by inflammation, encrusted with phosphate of lime, and preserving the attenuated form at its extremities: in a similar manner do the mucous membrane and the corresponding cellular tissue preserve in their cells, after the termination of inflammation, an albuminous substance, which augments their volume and their density."

mogeneous, rose-coloured, cellular tissue, which is confounded with the fibrous membrane. Behind this constriction of the membranous portion the urethra is larger than in a state of health. In the prostatic portion is remarked, on the left side of the canal, a fungosity of a reddish colour, dense and rugous in its consistency, and of the length of about six to seven lines. The projection of this fungus diminishes the diameter of the canal: the surrounding membrane is generally injected; the tissue which forms the fungus is greyish and friable; the membrane adheres strongly in this point to the layer of laminous tissue which separates it from the prostate."

The other subject, who was thirty, had at the left groin the recently formed cicatrix of a bubo;—at an inch in front of the bulb, in the spongy portion, the membrane was dry and rugous, and presented reddish striæ. The lacunæ of Morgagni were no longer apparent; the canal of the urethra, constricted by the thickening of the mucous membrane, was reduced almost to half its natural diameter near the bulb; it had the form of a cone, of about an inch in length, of which the summit was placed at the narrowest portion, which was the bulb:—all the membranous portion was healthy.

Changes of various other kinds succeed, no doubt, to inflammation of the urethra; and stric-

ture cannot be well known, nor can its treatment be well established, until repeated and careful examination shall have firmly established their nature and extent.

I have now passed in review a certain number of changes accompanying or succeeding to inflammation, and which have a tendency to contract to a greater or less extent the diameter of the canal of the urethra.

The first is that change which occurs during the progress of acute inflammation of the mucous membrane, in which tumefaction or engorgement exists to so considerable an extent as to cause occasional retention of urine.

The second is that state of thickening of the mucous membrane alone, or accompanied by a similar affection of the submucous cellular tissue, which generally occurs as a consequence of chronic inflammation in the canal.

The third is produced by those vegetations, succeeding to a chronic inflammation of this tissue, which project into and necessarily lessen the diameter of the canal.

The fourth is that state of the canal where the inflammation has terminated in an adhesion of its parietes, and in which a tolerably distinct septum, or valvular replication, is occasionally found. The mucous membrane, at the situation of these valves, appears reeved almost as if a thread were ran through its thickness and then

tightly drawn. Morgagni describes the progress of the last change in the following manner: certain erosions of the membrane are replaced frequently by some slight excrescences, which, in contracting, present at first fibres, and these become more and more dense, and form at last white lines which project in the cavity. Laennec supposed these "excrescences" to be false membranes, formed by a plastic exudation and supported sometimes by a large and prominent base. If, however, what I have already advanced with regard to pseudo membranes be correct, this opinion can have no foundation.

It now remains for me to describe more in detail, before I enter upon the question of stricture, three of the phenomena connected with the inflammation of the membrane lining the canal of the urethra—I mean induration, the question of reproduction of mucous membranes, and urethritis.

INDURATION.

By induration I understand that state of a tissue, generally succeeding to a chronic inflammation, in which augmentation of density has been produced by the deposition of some fluid within its cells. This disease of the mucous membrane appears to be produced by the distension of its areola with concrete albuminous matter. Induration presents numerous varieties as to colour and volume, and also as to the

absence or presence of other species of organic alterations. The indurated membrane rarely preserves its original colour, and is sometimes very pale,—whilst its volume is also variable. The first kind of induration which I shall describe is that in which the volume of the membrane remains stationary; the next and the more frequent where it is augmented; and the last in which, in some few but rare instances, the volume of the organ is actually diminished, a change of which we are occasionally presented with examples in the spleen. The question may here be asked, what are the causes under the influence of which a tissue becomes indurated? This I have already answered generally; but in a question of such importance, as connected with stricture, I conceive that a more extended enquiry is necessary. All we positively know is, that, in a great number of cases, induration appears in a part where there have long existed all the symptoms of inflammation. Does induration ever occur without being preceded either by inflammation or by increased action? Cases of induration have certainly been occasionally met with where no symptoms indicated the existence of inflammation during life; but we are not sufficiently acquainted with the laws which regulate inflammatory action to state that a tissue can change its consistency without having been previously

irritated or inflamed ;—and the induration of tissues is certainly most frequently preceded or accompanied by inflammation. Assuming, therefore, that we are wholly unacquainted with the first cause indispensable to the production of induration, we yet know that this cause very frequently manifests its effects as a consequent to an antecedent irritation, although we cannot with certainty assert that irritation must always precede induration. Irritation is the first apparent phenomenon manifestly preceding induration, and continuing after it is established. In the progress of induration (from the deposition of matter, and from the consequent increase of density), an obstacle gradually presents itself to the free ingress of fluids into the organ, and the indurated tissue then loses more or less of its colour and its vitality. The masses of matter which are deposited in the cells of the tissue are not susceptible of organization, and are almost inert—a circumstance which it is very necessary should be borne in mind. The performance of the functions of exhalation and absorption will be less active, and may indeed cease entirely, from the obliteration of the cellules of the tissue in which it is developed, the tissue itself having lost all indications of vitality.

If the change produced by induration be accompanied by what I have presumed it is, a decreased supply of blood to, and a consequent less

energy of action in, the tissue than it possessed in the natural state, we can hope to remove the induration only by stimulating the tissue, even in its early stages ; and if the induration be of so long a standing that the vitality has become almost extinct, it cannot, I apprehend, be removed except by the mechanical or chemical destruction of the tissue. Analogically, the possible necessity for destroying the indurated substance is shewn by tumours of a similar character developed externally ; where, although we have the greatest facility in making applications, those applications frequently prove ineffectual, and the knife is found to be the only remedy. In mucous tissues, however, it is necessary to distinguish the primitive irritation, which has preceded induration and has apparently been one of its causes, from another irritation, which may be termed secondary, and which supervenes to induration. We may conceive, therefore, that opposite modes of treatment have equally succeeded, according to the character of the induration. Where excited action is evident, the object should be to remove the congestion, and prevent its return ; and antiphlogistic treatment should of course be resorted to for that purpose : where, on the contrary, the indurated tissue is found in an asthenic state, we may, with much hope of success, apply a more or less energetic stimulus ; but it

must be obvious that great tact and judgment are required in varying the treatment with the various modifications of the disease.

REPRODUCTION OF MUCOUS MEMBRANES.

The next subject to which I shall advert is the reproduction of mucous membranes: for, if it be shewn to me that a solution of the continuity of these membranes cannot exist without danger, and that infiltration must follow their destruction, and if it be further established that reproduction of mucous surfaces is unknown, then I shall admit that the only rational treatment of stricture which can be resorted to is dilatation, and that none other can with prudence be adopted: but, if I shew that reproduction of these tissues does occur, then, so far at least as the continuity of the membrane is concerned, no such limitation of treatment is necessary.

John Hunter was distinctly of opinion that reproduction of mucous membranes did occur. Bayle, in later times, describes minutely the appearances of accidental mucous membranes in fistulous canals. Dupuytren establishes an analogy between the membranes in old fistulæ and mucous membranes; and Laennec also supported the same opinion. In the present day Villermé, whose researches have been as elaborate as they have been advantageous to

the progress of science, has published a very classical description of fistulous membranes; in which he has clearly established the great resemblance that exists between these membranes and mucous membranes. Cruveilhier has also described with much skill the similarity between the membranes in old fistulæ and mucous membranes. Chaussier states that he has frequently found membranes, bristling with villousities similar to those of mucous membranes, at the internal surfaces of old abscesses which did not communicate with the exterior. Cruveilhier and many other eminent authorities admit the reproduction of mucous membranes, even when they have suffered a loss of continuity*.

The following instance of reproduction is cited by Cruveilhier.—“A man, from whom Dupuytren had very successfully removed a

* “Qu’une plaie avec perte de substance existe à la surface d’une muqueuse, des caroncules s’y développent. La muqueuse s’y prête d’abord en tous sens pour la diminution de la surface ulcérée; mais bientôt ces caroncules, qui se seraient changées en membrane cutanée si elles avaient été placés à l’extérieur, se convertissent en membrane muqueuse. Sur une jeune fille atteinte de fièvre bilieuse ataxique, la moitié de l’épaisseur de la joue gauche tomba en gangrène, en commençant par la membrane muqueuse; un vaste ulcère en fut le résultat; des caroncules se développèrent et se changèrent en membrane muqueuse difficile à distinguer de la muqueuse naturelle.”—*Cruveilhier, Essai sur l’Anatomie Pathologique.*

part of the lower jaw which was in a cancerous state, died of adynamia in three months afterwards, just as the wound produced by the operation had completely healed: the two fragments of the jaw were found separated by an interval of an inch and a half, and, in common with the soft parts, confounded by the external third of their thickness in a cicatrix. The two internal thirds were covered by a mucous membrane of new formation, which was continuous with the mucous membrane of the mouth, and had the same aspect.

There are thus three situations in which the existence of accidental mucous membranes has been established—in old fistulous canals, in abscesses closed on all sides, and at the portions of mucous surfaces which have been destroyed. Beelard says, of mucous membranes—“ Elle a une force de formation tres developpée ; quand elle a été detruite, elle se reproduit promptement et avec tous les caractères du tissu naturel*.”

The possibility of the transformation of cellular tissue into mucous membranes will have for its support the analogy offered by the skin, in loss of substance of that membrane; whilst direct observation has demonstrated the reality of the transformation at the portions of mucous surfaces which have been destroyed.

* *Elémens d'Anatomie Générale.*

Andral says that, where the mucous tissue has been destroyed, the subjacent cellular tissue becomes in the first instance vascular; a little later it appears as a soft membrane, spongy, and having a species of vascular projections;—still later, the transformation is complete; and we cannot then discover any difference between the original mucous membrane and that recently formed.

With regard to the internal mucous membranes, to which he says he has more particularly directed his observations, he has described many degrees in their transformation. In a first degree, the submucous cellular tissue is reddish and smooth, and is then in progress from a cellulo-vascular to a mucous membrane; as yet, however, very simple. In a second degree, this cellulo-vascular membrane is elevated to the level of the rest of the mucous surface, but may not yet, like a mucous membrane, be detached from the surrounding substance. It has still a less complicated vascular disposition; and if the membrane it replaces had villosities, it is yet without them. In a third degree it becomes a *perfect* mucous membrane, may be detached from the subjacent tissues; and, if in the digestive tube, villi are produced upon the surface.

Although in most points the accidental membranes agree with the original mucous

tissue, it is certain that, hitherto, no follicles have been demonstrated upon them ; and, if we admit their existence, it is from analogy, supposing them to be too small to be discernible.

If we examine a fistula, we find, first, that granulations are developed in the extent of the canal ;—and in that state fistulous communications are most easily cured. The canal soon assumes a red aspect, is villous, and presents altogether the appearance of a mucous membrane ; as if nature always approached to the original plan of organization, even in the reparation of disease.

No great difficulty need be experienced in observing these changes in mucous membranes ; and it is of much consequence that these statements should be confirmed by future observations.

The cellular tissue is, in the embryo, the first in the order of development, and serves as the base to all the subsequent organization. It produces, by modifications little profound, the dermoid and fibrous tissues, the serous (which is formed merely by the condensation of the cellular tissue, and by its being disposed as a membraniform coat), the vascular, and various other tissues. This insensible transformation of cellular tissue may be shewn in an artery, or a mucous or serous membrane. On a careful investigation, it will be found that, in an artery,

the external coat is not distinguishable from the surrounding tissue by any line of demarcation, but that the one insensibly merges in the other, and that the adherent portion of each of these membranes terminates as insensibly in the cellular tissue with which it is continuous. I am justified, then, in laying down this position—that, however much of mucous tissues be mechanically removed, the immediately adjoining cellular tissue will possess nearly the same organization with the tissue removed, with which it was in immediate contact, and that it will be rapidly modified for the performance of functions similar to those of the tissue which has preceded it.

It must be recollected that all the component parts which I have described as entering into the composition of mucous tissues are not invariably present; and, whilst we are endeavouring to establish an identity between those membranes and many membraniform strata which are produced during a morbid condition, that circumstance must, on no account, be forgotten.

After what has been already stated, we may indisputably regard accidental membranes as at least analogous to mucous membranes; for, as I have before shewn, the only invariable difference that can be even contended for is the absence of follicles in the one instance and their presence in the other. Now, the absence of

follicles, in the case of accidental membranes, is by no means clearly established; whilst their presence, in mucous membranes, is not always demonstrable: so that the presence or absence of these follicles, in accidental membranes, cannot materially influence the question.

The special function of mucous membranes is the secretion of mucus. Is, then, this liquid found in fistulous canals? If it be, a longer discussion of the question is, I apprehend, needless. It is, no doubt, difficult to demonstrate its presence; because the fluid in fistulous canals is generally mixed with the fluid escaping by these openings: and yet Villermé has been enabled satisfactorily to shew, that accidental membranes have the faculty of secreting a fluid bearing all the physical characters of mucus. The fluid obtained by him was dissolved slowly in water. The solution was not coagulable by the application of heat: it was not, then, albumen. It did not become gelatinous by concentration, nor by cold: it was not, then, gelatine. The infusion of galls did not precipitate it, as occurs in solutions of albumen and gelatine: it was, on the contrary, precipitated by the acetate of lead. This does not occur with albumen or gelatine. Alcohol precipitated it from its solution.

These different characters are assigned to mucus by chemists; but these results are not

invariable. Although there is much difficulty in determining the question, yet I think, where so much difference of opinion exists with regard to the anatomical identity of these membranes, the identity of function ought to be admitted as establishing at least a similarity of structure. I have shewn, upon the testimony of some of the most celebrated pathologists of modern times, that a production takes place of a membrane bearing similar physical characters and performing similar functions with the original membrane; and if this has been established in a manner satisfactory to unprejudiced minds, I am satisfied. If it be denied that the accidental membrane found in fistulous or other canals is identical with mucous membranes, I answer that it is provided, like the latter, with a very delicate capillary tissue, and presents a similar appearance to those membranes. I have not, it is true, seen follicles in accidental membranes; neither have I done so in a great portion of the mucous system. It is quite sufficient for my purpose to shew that accidental membranes possess a similarity of character, of structure, and of function, with mucous membranes. I cannot be required, nor indeed is it necessary, to establish the identity of those membranes. My object is attained if I shew (as far, at least, as human ingenuity has proceeded in the investigation) that the accidental membrane pos-

sesses a structure and performs functions similar to the original membrane. Even if it were necessary to establish positive identity, in what way can that be done, except by proving similarity of function and similarity of structure? And, when those are established, how can identity be disproved?

CHAPTER III.

URETHRITIS.

CAUSES, SYMPTOMS, DIAGNOSIS, PROGNOSIS,
AND TREATMENT.

ORCHITIS. OPTHALMIA.

BEFORE I commence the description of that disease which accompanies inflammation of the urethra, and which is generally termed gonorrhœa, I beg to state, that it is not my intention to enter minutely into the phenomena or treatment of that disease, and that all I propose to do is to offer some general remarks upon its character and treatment.

In order to avoid misconception, I think it necessary to state that I intend to employ the word Urethritis for the purpose of designating all those affections of the urethra accompanied by a mucous, muco-purulent, or purulent discharge, and presumed to be dependent on inflammation of the mucous membrane by which that canal is invested.

It is not from a simple desire for innovation that I propose this change in the nomenclature of these diseases; for no one can be more entirely sensible of the inconvenience which is occasioned by such changes than I am: but, when I reflect upon the inapplicability of the terms now employed to convey to the mind a knowledge of those particular diseases to which they are applied, I cannot help feeling convinced of the propriety of adopting some term which would be more precise in its signification than those now used. When I look at the terms gonorrhœa, blennorrhagia, and blennorrhœa, I not only see that, as terms, they are radically incorrect, even when used for the purpose of distinguishing any particular period of the disease, but, when applied, as they ordinarily are, to the disease generally, without reference to particular periods of its duration, I can no longer hesitate in adopting a term which is undeniably more precise in its signification and better adapted to the object required. To specify particular forms, I shall use the prefix acute or chronic, contagious or non-contagious.

CAUSES.

Urethritis is produced by different causes. The first of those to which I shall allude is purely mechanical, the second chemical, and the third *virulent*, by which I mean a disease produced

by the application, upon the mucous membrane of the urethra, of contagious matter, either by connection with a person suffering from contagious urethritis, or by any other mode of contact.

Among the mechanical causes are venereal excesses between two individuals in whom the genitals are perfectly healthy. This may produce, in one or both, a more or less intense urethritis. This is a fact which constant observation verifies. We have seen a woman, in the apparent enjoyment of the highest health, a connection with whom produced urethritis in all who had connection with her, and who yet never suffered from urethral or vaginal discharge. Cullerier mentions the case of a girl who had never been affected with urethritis or vaginitis, and in whom the organs, when examined by him, were perfectly healthy, who communicated to a young man urethritis of an extremely acute character; and examples of this kind might easily be multiplied, were it necessary. Masturbation, if violent, will produce urethritis; and indeed the disease is not unfrequent in girls addicted to this vice. In boys the disease is less frequently produced by this vice, from obvious causes; for it is produced only by the irritation occasioned by violent or continued friction of the mucous surface in girls; and, as contact with the interior of

the urethra is not produced in the male, the difference is easily understood. The violence suffered by young girls from libertines very frequently produces a similar affection of the vagina, while the authors of such violence may be exempt from the disease—the contusion and distension of the sexual organs being sufficient to occasion the discharge. This is a fact which should be borne in mind by medical practitioners who are required to give evidence in courts of justice, in cases where forcible attacks have been made upon females. Great circumspection should be used in asserting the existence of contagion; for the person accused may prove the absence of the disease in his own person, and may exculpate himself by the testimony of his accusers. The accused may answer thus—“ You say this infant has a contagious discharge, and that the contagion has been communicated by me; but I am not suffering from the disease, and it is therefore impossible that I can have committed the violence imputed to me.” This has occasionally occurred. Two summers ago, an individual was accused, in Paris, of having committed violence on a young child, and of having communicated to her a contagious affection. He was examined by order of the Court, and found perfectly healthy. It is true that cases frequently occur where violence is committed on young

children by persons who are suffering from contagious urethritis, and who are in some instances prompted to the commission of the crime by a belief, still common among the vulgar, that by communicating the disease to a virgin they remove it from themselves.

We may also enumerate, among the mechanical causes of urethritis, contusions of the perineum, the presence of stone in the bladder or in the urethra, strictures, and, in fact, every thing which may mechanically irritate the urethra, or the parts to which it is related, either directly or sympathetically. Urethritis produced from these causes is, however, rarely very acute (though much more frequent than is generally supposed), and readily ceases when the exciting cause is removed.

Chemical irritants also excite inflammation of the membrane of this canal, and produce augmented secretion : but urethritis from these causes is so rare, that we have no other well-authenticated cases than those produced by Swediaur on his own person. He produced a very intense urethritis, altogether similar in character to that which has a venereal origin, by injecting into the urethra a weak solution of ammonia.

It is very common to see urethritis succeeding to connection with a woman during the existence of the menstrual flux ; and perhaps

more frequently to connection with women who have lochial or leucorrhœal affections.

The cause considered by the world, and even by medical men, as the most common origin of urethritis, is the application of the substance secreted by mucous membranes which have been subjected to the contact of contagious matter : and this is, I apprehend, the only manner by which a contagious urethritis can be produced.

The internal causes by which urethritis may be produced are not less numerous. Irritations of the alimentary canal, cutting the teeth (this is, however, an unfrequent cause, and is more rare in boys than girls), certain aliments or medicinal substances, as beer, turpentine, tea, asparagus, cantharides, and spices, may occasion in the urethra an irritation which not only renders the emission of urine painful, but produces an abundant discharge from the urethra. Schenk speaks of a man who could produce a gonorrhœa at will by eating cress.

“Irritations of the mucous membrane of the air passages are often accompanied by urethritis.” If it be true that such diseases are occasionally accompanied by affection of the urethra, we may have less difficulty in admitting, with Blassius, that urethritis may be epidemic. I am not satisfied of these complications ever existing ; but they have been observed by Fa-

bre, Goulard, Morgagni*, and Noel, in some very hot seasons which were very rapidly succeeded by cold, humid weather. We know that these sudden changes almost invariably affect mucous membranes generally; and I confess I can see no sufficient reason why they may not similarly affect that of the urinary passages. It may be said that the latter is less exposed to the action of those changes. That is, no doubt, true; and it is equally true that it is here much more rarely produced: but we see many persons with clothing insufficient to protect this membrane more effectually than that of the mouth.

Again, diseases of the skin accompany or alternate with urethritis. Of these diseases, lepra appears to be the most frequent concomitant. That urethritis which is said to be produced by, or to accompany, lepra, was particularly frequent in the fifteenth century. May we believe that it is this which is so well described by Moses? Still, in spite of the im-

* "Acciderat per eos dies, ut quatuor alii Cives præter eum de quo dictum est, eodem morbo de improvise corriperentur, et quod postea Hallæ Magdeburgicæ vere anni 1730 Cl. Bassius observavit plane inauditum, ut legitima gonorrhœa epidemice grassaretur, sicuti observationibus quatuor prolatis testetur, id nos Foro Livii, urbe non pro eo ac meretur, fuitque olim, incolis minium affluente, vere anni 1710."—*Morgagni*, loco citato.

posing authorities who advocate such doctrines—in spite of their conviction that the disease produced by such causes cannot be distinguished from those succeeding to contagious intercourse—in defiance of their conviction that the symptoms, the varieties, the complications, the consequences, are identical—that the matter exhaled resembles perfectly in the one case to the other (being dependent in either case on the degree of inflammation)—I must elevate my feeble voice against this doctrine of identity; for, varied as have been my opportunities of watching these diseases, frequent as have been the opportunities afforded me of ascertaining the opinions of the greatest authorities on the subject, I feel no hesitation in laying down a positive opinion, in saying that the discharge proceeding from an urethritis produced by these causes can never produce a contagious disease of a similar character in the person upon whom it has been applied.

In modern times, up to the present moment, I know only one person who affected to be able to distinguish an urethritis of a contagious character from that which was not so. Wedekind says that he has established a character by which it may be distinguished. The character consists in this—“that, in men who have been infected during coitus, there is developed, immediately behind the meatus urinarius, two

small lenticular tubercles, situated the one by the side of the other, and very sensible to the touch. In examining," says he, "many subjects who, after a suspected connection, were apprehensive of having contracted a contagious urethritis, I can each time announce before the appearance of the disease (after the formation of the tubercles), whether the affection be contagious or non-contagious. When I do not feel these small bodies, contagious urethritis will not supervene, whatever may be the extent of the itching in the gland and the prepuce, and notwithstanding the heat in urining. They enlarge and become more sensible when the lips of the orifice of the canal begin to swell, and a mucous viscid humour bathes the gland. They enlarge at the commencement of dysury and the period of inflammation. These tubercles are always the most sensible part; they diminish in violence and sensibility in proportion as the disease decreases; but we cannot regard it as being entirely dissipated until they have become quite insensible. All appearance of the disease may disappear, not only for some days, but for entire months—the patient may believe himself completely cured—but a cold, an error in regimen, fatigue, excess in coitus with a healthy person, in fact, any thing which may irritate the urethra, may cause a return of the discharge, so long as these two tubercles

are more or less sensible." Such is the opinion of Wedekind. I need hardly say that his opinion is without foundation; for these tubercles are developed every day by simple irritation, and in persons who have never suffered from urethritis.

The question has long been discussed, whether the matter secreted at the surface of a primitive venereal ulcer ever produces "gonorrhœa," and if the matter of "gonorrhœa" ever gives birth to chancre? and, after all the elaborate investigations which have been resorted to for the purpose of determining this question, it is yet undecided.

IDENTITY OF VIRUS.

We are bound to admit the existence of two very distinct species of urethritis; the one of a contagious nature, the other not so. These two species, although identical in appearance, present a very essential difference, though it may be impossible to seize the difference, the event alone serving to give us a knowledge of it. Is the virus which produces contagious urethritis the same with that which produces syphilis? And may the latter disease be a consequence of the former? The first question appears to have been determined by many writers: with respect to the second, Hunter expresses himself thus—"The matter of a gonor-

rhœa may produce either gonorrhœa or syphilis, and the matter of a chancre may also produce a gonorrhœa or syphilis." This mode of expression is not equivocal, and must have been the result of an entire conviction on his mind. The number of cases mentioned for the purpose of establishing this point by Hunter, by Cullerier, and Freteau*, is sufficiently formidable to ensure a conviction on this subject. The syphilitic character of the disease is asserted by Delpech†, on the following grounds:—"That he has often seen the same person, affected either with gonorrhœa or chancres, communicate indifferently to many persons of the opposite sex gonorrhœa, chancres, or both united.—That it is not rare, after leeches have been placed on the groin or on the course of the spermatic vessels in attacks of gonorrhœa, to find the bites of

* "Le Memoire de M. Freteau sur l'Identité de Nature entre le Virus Gonorrhœique et celui de la Vérole."

† "Si la question relative à la possibilité d'une infection générale par l'effet d'une gonorrhée syphilitique n'était pas suffisamment résolue par l'observation, nous pourrions citer un grand nombre de faits affirmatifs. Sans nier qu'il n'y ait un grand nombre de cas dans lesquels cette conséquence n'a point lieu, nous pouvons assurer que, dans un grand nombre d'autres, la syphilis n'a pas d'autre origine. Cependant, les exemples de developpement consecutif des symptômes propres à la syphilis dans les cas de gonorrhée demontrent aussi que l'absorption et l'infection générale peuvent avoir lieu."—*Delpech, Clinique Chirurgicale.*

those animals transformed into chancres; and that, in patients presenting symptoms of infection, he found about one fifth who had simple gonorrhœa; never more than one fifth with chancres alone, whilst the remainder had both symptoms at the same time." Carmichael has sought to demonstrate the plurality of syphilitic virus, and is convinced that gonorrhœa and the different kinds of chancre owe each its origin to a different virus. The inclination of opinion, then, in the present day appears to be that there are gonorrhœal discharges which may produce chancre; and that subjects affected with chancre may communicate gonorrhœa only. But here the fact rests; for we have neither the means of distinguishing a contagious from a non-contagious urethral discharge, nor whether the matter of chancre can produce urethritis.

Another question has been much agitated, whether gout, rheumatism, and affections of the skin may produce urethritis. I should certainly contend that the appearance of gout or rheumatism simultaneously with urethritis is a simple coincidence, and that one affection is not consequent upon or connected with the other. That a person affected with gout or rheumatism should contract or suffer from urethral discharge, is natural; but something more than mere assertion is required to prove that there exists a real connection between gout, rheuma-

tism and inflammation of the urethra. It should be borne in mind, and this is matter of observation, that persons affected by diseases of the skin, by gout, or by rheumatism, are more liable than others to be affected with urethral discharge after connection with a healthy person. I presume that a connection between gout, rheumatism, and inflammation of the urethra, is only explicable upon the supposition that, in those cases, an inflammatory disposition exists in the system, to be manifested wherever a slight irritation is caused. It is by reason of this inflammatory predisposition in the system, that urethritis is found more frequently in those seasons of the year when the temperature is variable, as spring and autumn; though mucous membranes are peculiarly subject to inflammation at such seasons, apparently without such predisposition. It has been observed, in L'Hôpital des Veneriens in Paris, that in those seasons cases of urethritis are incomparably more frequent than in the summer or winter.

The connection between diseases of the skin and those of the urethra admits of a more plausible explanation than that between those diseases and gout or rheumatism. The organization of the skin bears so much resemblance to the mucous tissue lining the urethra, their continuity is so perfect, and their sympathies so intimate, that in irritable subjects an irrita-

tion existing in the skin may induce us almost to expect an affection of the urethra from a slight cause.

It is difficult to determine to which class of causes to refer the abuse of beer, which is said frequently to produce a mucous discharge from the urethra, which is speedily removed by administering to the patient a little wine or brandy. Urethral discharges attributable to this cause are said to be not unfrequent in Germany and Holland; and the only way of accounting for them is to attribute them to the irritation produced by the excretion of urine, which the excessive use of beer produces. As the emissions of urine become from that cause much more frequent, and its qualities more acrid, an irritation of the urethra may be produced, and be succeeded by an increased secretion from its mucous membrane. Though the use of wine or brandy is supposed to put an end to the secretion, it is, I apprehend, much more rationally explained by assuming that the immoderate use of beer is at the same time suppressed.

If it be true, as has been asserted, that the excessive use of tea, turpentine, asparagus, and other substances, have sometimes caused urethritis, they can have done so only by producing an increased excretion of urine of an acrid quality.

SYMPTOMS.

Varied as may be the causes of urethritis, the singularly uniform character of the symptoms by which this disease is distinguished renders it impossible to detect, through their medium, the origin of the disease. Some time after sexual intercourse, or simple contact of the penis with the inflamed or ulcerated genitals of a woman, various symptoms arise announcing an irritation of the canal. At first the man experiences, at the orifice of the canal, or in a greater or less portion of its extent—sometimes only in the gland—an itching sensation, more agreeable than otherwise, accompanied by a slight sensation of heat, which induces a more frequent disposition to urine than is usual, increases venereal desire, and excites long-continued erections, which occur especially during sleep. To these symptoms are frequently joined an uneasy sensation in the groins, the spermatic cord, and the testicles, with a sentiment of plenitude, of weight, and of constriction, along the whole of the inferior portion of the penis, accompanied occasionally by lancinations. At the end of two or three days, the titillation, at first vague and disseminated in a great number of situations, though referred generally to the gland—the common centre of all the sensations occasioned by irri-

tation in these organs—this titillation is concentrated near the extremity of the penis. It changes its character and gradually becomes painful, and converted into an inconvenient smarting, especially during the emission of urine. The orifice of the urethra acquires an excited sensibility, becomes inflamed, its borders are reddened and tumefied, are removed the one from the other, appear almost excoriated, and give issue to a small quantity of a serous, limpid fluid, whitish, or slightly yellowish; which stains the linen. Soon, the patient feels, in all the canal, which becomes hard and projecting externally, a tension, accompanied by a disagreeable heat and lancinating pains. The desire to urine becomes more and more frequent; but the contraction of the canal, which is owing to the tumefaction of the mucous membrane, occasioned by the irritation caused by the want to empty the bladder and the passages of the urine, goes on increasing; so that this latter escapes by a very small jet, which diminishes progressively though rapidly. This jet is frequently interrupted, and takes those forms which are impressed upon it by the various alterations which are produced in the canal. The evacuation of the urine is frequently solicited by a fatiguing titillation at the neck of the bladder and at the anus, and in such an imperious manner that it becomes almost involun-

tary and is repeated every moment. The liquid in its passage produces a burning sensation, from which it has derived the name of "chaude-pisse." The most vivid pains are those which are felt at the moment when the urine begins to pass: they diminish a little during the time the urine is flowing, and reappear with more intensity when the last drops are expelled—a phenomenon especially owing to the more rapid movement which is impressed upon the fluid by the contraction of the perineal muscles, which are almost spasmodically affected.

The frequency and the duration of the erections augment principally during the night, when the patient rests, extended upon his back, in a soft bed, covered by warm clothing. The violent pains which they excite destroy sleep, and frequently oblige the patient to get up. These pains render sexual connection, if not absolutely impossible, at least very disagreeable and painful; so much the more that the passage of the semen produces an insupportable heat, which may be compared to that produced by a red-hot iron. The erection and the ejaculation often occasion a hemorrhage, which produces a slight alleviation. At this time the patient experiences, along the inferior portion of the urethra, an inexpressible sensation of uneasiness, sometimes accompanied by lancinating pains, which constrain the power of walk-

ing, and render it painful to stand long, to sit, or to cross the legs. He is tormented often by an obstinate constipation and by a tenesmus, of which, frequently, he complains more than of the urethral affection. The discharge, which continues day and night uninterruptedly, gradually augments and becomes very abundant. It consists of a thick matter, at first whitish, then yellowish; sometimes streaked with blood; at last, brownish, or of a dirty green, which exhales a peculiar odour. This matter leaves on the linen yellowish, greenish, or dirty greyish spots, paler at their circumference than their centre, and which, after becoming dry, are not removed by rubbing. When it has existed about a fortnight, more or less, it begins to decline. The dysury diminishes, as well as the heat caused by the passage of the semen or the urine; the erections are less frequent and less painful; the discharge becomes more consistent and opaque;—when placed between the fingers, exhibits more viscidty;—soon it altogether terminates; and the mucous membrane having retaken its natural character, the disease is terminated.

It must not be forgotten that these symptoms are modified by the age and the constitution of the patient, the state of other organs, his daily regimen, the state of the urethra with reference to antecedent affections, and perhaps certain atmospherical influences.

The characters of the discharge have been, by many, considered a subject of great importance. They are, however, dependent upon the degree of the inflammation and the constitution of the patient. They have nothing invariable, either in their appearance or in their succession: and this should be very generally impressed upon the minds of patients; for they occasionally suffer much alarm from what they consider an unusual colour in the discharge. Every day we may see that a few hours only are required, if strong exercise be taken, or any error in regimen be committed, to produce in a discharge, the most benign in appearance, a yellow or greenish tint. All exhalant surfaces, either natural or accidental, equally offer shadows in colour, density, and other qualities of their products, according to the degree of excitation which is communicated to them by an external cause, or by a more or less vivid stimulation of those organs which are united to them by sympathy. We see discharges, white from their commencement, last very long; whilst others, which have early assumed and afterwards retained during their whole existence a dark green colour, or which have been strongly charged with blood, terminated in the most rapid manner. Still we should regard as favorable the thickening and increased viscosity of the discharge as the disease advances, though

it may not enable us to announce a prompt termination of the disease.

Much contrariety of opinion exists as to the time which may elapse between sexual intercourse with an infected person and the appearance of urethritis. The time has been variously estimated — from twenty-four hours to the third or seventh day, or even to the fifth month after connection. It may be questioned whether it has been satisfactorily shewn that the disease ever remains dormant for so long a period as five months. It is, however, impossible to offer any positive opinion as to the time after sexual connection, within which an urethral discharge may appear. Whether urethritis has appeared in twenty-four hours after connection or in as many weeks, we can in neither case positively assert that the disease is not contagious; although, when the discharge from the urethra has not manifested itself for a long period after connection, we should be slow to attribute it to contagion, or to believe it contagious.

Cullerier introduced into the urethra, for the distance of two inches, a bougie smeared with gonorrhœal pus, taken from a person in whom the disease was recent and had been subjected to no treatment. This application was twice repeated on successive days, and the bougie suffered to remain in the urethra each

day for three quarters of an hour : the result was the production of a gonorrhœa on the third day, whilst the introduction of a simple bougie did not produce a similar effect. I recollect witnessing the application, in a similar manner, of matter discharged from the urethra of a person who had eruptions on the skin, but who had not been sexually connected for two months previous to the appearance of the discharge ; but it was not succeeded by any discharge.

We do not know at what period a discharge, proceeding from a contagious urethritis, ceases to be contagious, if indeed it ever does ; though it is stated that, in the chronic state, contagion is less commonly communicated.

The distinction between contagious and non-contagious urethritis is by no means well marked ; and our diagnosis of the disease is, therefore, extremely imperfect. But those inflammations of the urethra produced by any other cause than connection with an infected person, are in general less violent, less painful, less durable, and produce less serious complications ; except when the cause which has produced them is perpetuated.

An important point to determine in urethritis is the question of contagion. It is almost universally admitted that the matter of certain discharges from the urethra, when applied upon the mucous membrane of a healthy person,

determines an irritation or inflammation, simple or complicated, with ulceration and excrescence. This is stated as the case in those discharges succeeding to impure connection; but whether it be the case in urethritis generally, is yet undetermined. A general and decidedly a prudent opinion is, that a man suffering from any discharge from the urethra, even the most benign in appearance, ought to abstain from sexual connection until it be removed; and this not only on the woman's account, but on his own. Bell thinks that a discharge ceases to be contagious as soon as the inflammation which has primitively determined it is entirely dissipated, and that the discharge becomes again contagious when the inflammation is exasperated anew, and the discharge reassumes a puriform aspect. I, however, can scarcely admit that, so long as the discharge continues, the specific inflammation has ceased; and if not, then I presume this distinction is insufficient. The examination of the person from whom the disease is supposed to have been derived will not always place the medical practitioner in a condition to determine positively whether the disease be the production of an infected intercourse or not; and embarrassment may then exist with regard to the treatment which should be adopted.

Pain has sometimes been the only, or at least the principal, symptom of urethral inflam-

mation; and this form of the disease, which is perhaps more painful than any other, is called, in consequence of being unaccompanied by discharge, dry gonorrhœa. We most frequently observe this affection succeeding to inflammation, with a morbid secretion, particularly after the secretion has more or less suddenly disappeared. The pain which then remains is acute, is augmented under the influence of all stimuli, external or internal, and, during the emission of urine, and especially in erection, it is described by the patient as equal to that which accompanies acute urethritis; but the canal, when explored, presents neither stricture nor any other apparent disease. This affection is not common; it is ordinarily of long duration, and excites the apprehensions of the patient to such a degree, that he will undergo any sacrifice or pain to be rid of it.

I have seen only one case of this affection. A man of twenty-eight, in good health, who had never before suffered from any affection of the sexual organs, had, a year previous to my seeing him, an urethritis, which was discovered on the tenth day after connection, and which, having existed eight days, terminated spontaneously. From that period he had experienced in the urethra extremely acute pain, unaccompanied by discharge. Rigid diet and a freedom from exercise of a fatiguing kind caused the disease

to disappear; but, when his exercise became fatiguing, or his diet irregular, the pain returned with violence, especially during the emission of urine or semen. His general health continued good; and, in some months after the discharge had disappeared, he had connection with two or three females, to whom he did not communicate the affection. The penis presented no appreciable alteration; a sound of large size was admitted without difficulty; the jet of urine was as large as usual. He had been directed to rub, on the inferior surface of the penis along the canal of the urethra, mercurial ointment, in combination with camphor, extract of belladonna, and hydriodate of potash: opium and mercury were administered internally without success. After much anxious reflection, we determined to produce a discharge from the urethra by introducing a bougie smeared with virus, obtained from a patient suffering from contagious urethritis. It was, however, deemed prudent to endeavour first to produce a discharge by simply irritating the canal: accordingly, an irritating injection was introduced into the urethra. The injection produced a profuse discharge, which terminated in a few days, and with it the pain which had produced so much anxiety and distress.

This is the only case of the kind I have seen. I cannot therefore state that the symp-

toms I have described are those by which the disease is uniformly attended. I have heard, however, of two other cases, which I propose to term Urethralgia, the symptoms of which were very similar to those I have mentioned.

The uncertainty of the diagnosis in urethritis must necessarily render the prognosis equally doubtful—only, however, with regard to the complications by which it is occasionally accompanied; for, as to the disease itself, when simple, it presents little difficulty and occasions no apprehension. Contagious urethritis, indeed, is not more to be feared than any other species of the disease, at least immediately; and those affections which occasionally accompany the disease, such as retention of urine, inflammation of the testicle, and ophthalmia, have no necessary connection with the urethral affection: each of those affections, on the contrary, has its special prognosis, distinct from that of urethritis, which frequently ceases at their appearance and during their continuance. Many other diseases may coexist with urethritis; and they ought always to inspire inquietude, in as far as they may relate to the excretion of urine. It is seldom that the canal resumes its original calibre if it has often been the seat of inflammation, especially when that inflammation has been treated by astringent injections at a time when the parietes of the urethra were already the seat of engorgement.

TREATMENT.

Whatever may have been the exciting cause of urethritis, the antiphlogistic treatment is that best adapted for the cure of the disease; but it is not the only one which may be opposed to it with success, as I shall have occasion to mention hereafter.

When called to an attack of urethritis, if acute and violent in its character, we should at once resort to vigorous antiphlogistic treatment; because, whilst our chances of success are more numerous, we need not fear, if we fail, that the disease has been aggravated by the treatment, which may occur when we employ in the first instance the revulsive method. Thus, one or two general bleedings and leeches to the perineum and groin, are the means the most likely to abate the inflammation at its commencement, to lessen the sufferings of the patient, and to prevent the ulterior development of unpleasant symptoms. The application of leeches to the penis, recommended by some authors, is certainly an improper practice; it is frequently followed by ecchymosis, caused by the infiltration of blood into the lux cellular tissue of that organ, occasioning inflammation and sometimes gangrene. Hip baths or entire baths, renewed each day and prolonged during many hours, are of great utility. In the bath the patient is generally exempt from the pain

of erection, the urine is voided easily, and he experiences an abatement of the symptoms, which encourages him to persevere in the employment of this means of alleviation. Large quantities of diluent fluids should be taken, which, independently of their effect in diminishing the general inflammatory disposition of the system, have also an action which is entirely local. In producing more aqueous urine, they render its impression on the mucous membrane less sensible, and in this manner concur to shorten the duration of the disease; but the principal security for their successful administration is that they be taken in large quantities. Patients were often cured very rapidly who have taken, during the twenty-four hours, five or six pints of water. I would not recommend the system of many practitioners who add to the portion nitrate of potash: nothing appears more diuretic than simple water taken in abundance, and it will be found that the employment of nitre in small doses has so feeble an effect as to be scarcely appreciable.

The hygienic means ought to hold a first place in the treatment of this disease: without them the other therapeutic agents have only an uncertain efficacy. Repose and gentle warmth are powerful auxiliaries to a prompt and successful termination of the disease, and prevent the occurrence of many unpleasant symptoms.

In conjunction with these, a regimen carefully regulated, from which excitants of all kinds have been altogether excluded, should be firmly persisted in: yet sometimes the preponderating symptoms require that particular attention should be accorded to them, and that special means be directed to their removal.

When the pain is extreme, which is rarely the case if the evacuations have been sufficient, we have recourse to opium, internally or externally: but this medicine has no good effects when we employ it alone during the period of acute inflammation.

Camphor enjoys a great reputation as a means to diminish the painful erections by which patients are frequently tormented. What has been said of opium is equally applicable here. It has frequently been tried; and the result is, that it is not applicable in the acute stages of inflammation, when not combated by appropriate means, and frequently indeed produces effects totally opposed to what we expect. If, however, painful erections supervene at a period when the inflammation has suffered considerable diminution, these medicines may be administered with advantage.

Such appear to be the means which should be employed in the treatment of acute urethritis. Patients would be cured most promptly, and would be less exposed to relapse and to

consecutive accidents, if this methodical treatment were always employed. Unfortunately, it is very rare that such is the case: urethral inflammation is too frequently considered as an insignificant affection, requiring little care or attention; and therefore it is that we have so frequently presented to us urethrites which have passed to the chronic state, and which have occasioned organic affections of the urethra and the surrounding organs.

When the disease has primitively a slow march and a character little inflammatory, or when it has been brought to that state by preliminary treatment, or by the natural decrease of inflammation, the antiphlogistic treatment is still that which promises most success; and, in pursuing that treatment with nearly as much activity as if the disease were of an acute character, we frequently derive much advantage. Local bleedings are very advantageous in cases where many practitioners, deceived by appearances, see only an asthenic state, and employ excitants, which prolong the duration of the disease. Mild treatment, continued with perseverance, is assuredly that which counts the greatest number of solid cures.

In cases where the disease is much prolonged, Cullerier has remarked that it is more liable to reappear independently, or in consequence of

sexual connection with a healthy person, than if promptly terminated.

In the methodical treatment of urethritis, as in that of many other diseases, all the therapeutical agents may, according to the peculiar symptoms, be successfully applied. It is thus that particular excitants, applied either directly to the mucous membrane of the urethra, or revulsively to the digestive canal, or on the skin, are often found advantageous as well separately as in combination with the antiphlogistic treatment. It is, however, either previous to the development of inflammation, or when time and treatment have lessened its activity, that we may expect their good effects: they will be dangerous during the period of active inflammation.

This manner of treating the disease is not new; and, without entering into historical details, which would be foreign to the end I have proposed, I shall merely state that all the authors who have written on the disease have more or less strongly advocated the employment of excitants. Many of them, it is true, appear to have mistaken, or at least ill comprehended, the mode in which they act, and have attributed to the specific properties of the medicine that which was the result of a stimulus opportunely applied.

Bearing in mind these principles, of which observation and experience have established the truth, we proceed to examine the methods of treatment by injection, by bougie, by cauterizations, and by the various medicines which have been from time to time employed for the cure of urethritis.

It is an incontestable aphorism, in pathology and general therapeutics, that, at the commencement of an inflammation, an artificial irritation of another kind may arrest its progress. Is this effect produced in neutralizing a peculiar principle, or in modifying the vitality of the affected part? That is a question I shall not here attempt to determine; but the fact itself is demonstrated by multiplied experience: and it is also equally well known that counter-irritation, when not applied at the proper time, or with sufficient energy, augments the disease which it was intended to remove. Thus it is with urethritis. If, at the moment the disease is manifested, an irritating astringent injection, or even a tonic or caustic one, be applied, or if we cauterize with potassa fusa the fossa navicularis, we may arrest the inflammation more or less completely. Entire success now and then attends these operations; but, to succeed, it is necessary that the affection be taken at its commencement; and it is exceedingly rare that patients present themselves in time. When

the inflammation is once established, this mode of treatment would be imprudent ; besides that the pain experienced by the patient would render it almost impracticable ; and it would have no other result than to increase the irritation, and to produce partial induration—a proximate source of stricture.

Many authors advise that it is injudicious to abridge the duration of urethral inflammation, and recommend that the discharge should not be interfered with ; supposing, as they do, that, if left to itself, the virus will be completely evacuated. Few practitioners, however, in the present day, echo this sentiment. It is now generally believed that it is advantageous to shorten, as much as possible, the duration of urethritis ; and that, if the object of inflammation were to evacuate a morbid principle, abundant discharges ought to be more favourable than those of an opposite character, and ought to abridge the course of the disease : whilst we observe, generally, a contrary effect—a circumstance which should suffice alone, even if reason did not come to its support, to demonstrate that the quantity of matter which escapes does not depend upon the morbid principle, but upon the extent of the inflammation, or the degree of super-excitation of the affected part. Others think that consecutive accidents are more common after a prolonged discharge, and

counsel abridgment—an opinion to which I decidedly conform. I think that there can be no inconvenience in suppressing a discharge, at its commencement, by the revulsive method; and that strictures are occasioned frequently in consequence of the employment of direct astringents at an advanced period of the disease; and this because the partial engorgements which are formed remain in a state of induration.

When the antiphlogistic treatment has been strictly adhered to, it is rare that the disease proves obstinate; and when it does, we generally discover the cause of the obstinacy either in the regimen of the patient or in some lesion of the prostatic or other portion of the canal. Still there are cases in which the morbid secretion continues, apparently almost from habit, whilst the inflammation is scarcely perceptible, and whilst we are unable to discover an alteration of the tissue. It is under such circumstances that a more or less active stimulus is of use; that an injection of wine and water, pure wine, a solution of acetate of lead, or sulphate of zinc, a superficial cauterization, the introduction of a bougie, or even venereal excesses, may, by modifying the diseased surface, terminate the secretion of which it is the seat.

The mysterious preparations of quacks succeed when, by a happy chance, they are admi-

nistered under favourable circumstances. But how frequently do they not fail!—without speaking of those cases where they aggravate the disease, and where, after abandoning them, repose, regimen, and mild treatment, have cured the patient.

In the chronic state of this disease, the balsam of copaiba has been prescribed with much success; and though it has been for many years in general use, yet we know but little of its mode of action. Some persons assert that copaiba produces a “derivation” to the digestive tube, and thus sympathetically affects the urethra. I do not deny that intestinal irritation may be useful, or that it frequently promotes the cure of the urethral disease; but I certainly doubt whether the beneficial effects of copaiba in those cases be dependent upon its action on the intestinal canal. I think the balsam and the resins, more particularly the turpentine and copaiba, act specifically on the urinary system: and this opinion is warranted when we consider that those substances occasionally cure the disease without producing a sensible action on the bowels, and that in a very little time after their administration; the urine becomes less irritating, and acquires a peculiar odour; and, within six hours after the administration of copaiba, its presence may be easily detected in the urine of some persons.

I recollect a case where a person who was affected with urethritis took a large spoonful of copaiba. Although he ate his meals regularly, he was suffering for thirty-two hours from nausea. At the end of this period, the medicine, together with the whole of the food consumed during that period, were ejected from the stomach. The bowels had not been affected by it; but, during the last twenty-four hours, the urine was strongly impregnated with the odour of copaiba. The urethritis was entirely cured without the use of any other medicine. Whether, in this case, the cure was effected by the effect of the nausea upon the circulation, or by the specific action of the copaiba on the urinary organs, I confess my inability to determine. It is evident, however, that it was not produced by purgation.

The specific action of turpentine and copaiba is further rendered probable by the recent researches of Ribes, Delpech, and Ansiaux.

These gentlemen were occupied almost at the same period of time in experimenting upon the administration of copaiba in cases of urethritis; and each arrived at conclusions which I shall make no apology for introducing. First, "It is useless to allow discharges from the urethra to exist for a long time, and ridiculous to suppose that, when the usual precautions are observed, the suppression of the discharge can

in any way injure the health of the patient." Secondly, "Individuals expose themselves to many accidents in promoting a discharge from the urethra, and may retain it for an indefinite time." Thirdly, "Copaiba, administered in large doses, say from one to three drachms, three times daily, or indeed in much larger quantity, even during the acute period of the disease, diminishes the pain, produces abundant purgation, and ordinarily cures the discharge in the space of three or four days."

When the copaiba acts as a purgative, these gentlemen add to each dose of the medicine a quarter, half, or even sometimes a grain of opium, and give it an hour before a meal, for the purpose of avoiding the effects of narcotism upon digestion. Delpech remarks that, when the medicine is digested without disturbance, and in sufficient doses, the second or third day is rarely passed without a considerable alleviation of the pain: the discharge sometimes diminishes very rapidly; even from the first day, the chordee, and especially the frequency of the erections, experience a sensible amendment. He adds that this amelioration is always more difficult to sustain than to produce; that, at the end of eight or ten days at most, all the symptoms are dissipated; but that, in general, the copaiba ought to be continued for five or six days, or even eight days; and that

this species of confirmative treatment requires equal doses to those by which the cure has been effected: after that, we may abandon it either abruptly or by insensibly reducing the doses according to the greater or less facility with which it has triumphed over the disease. He recommends that, in those cases where the action of the medicine appears to produce much derangement upon the animal economy, its use should be intermitted from time to time, and that, although the urethral symptoms are partially reproduced during the intermission of the remedy, they give way promptly on resuming the medicine.

There are cases where the patient cannot take this medicine in any form; and in these cases I have succeeded quite as fully by making it into an emulsion by means of mucilage or the yolk of an egg, and administering it as an enema in doses of two or three drachms.

Before the researches of these gentlemen were known, it was generally recommended that copaiba should not be administered until after an almost entire cessation of pain; and it is certain that this medicine, if administered while the excretion of urine is yet painful, frequently augments the inflammatory symptoms. It would be absurd, however, to pretend that the copaiba is applicable to every case: it is always inapplicable when the stomach is irrita-

ble or inflamed: it not unfrequently produces gastritis, gastro-enteritis, and other affections, in persons otherwise in good health. It is, however, an axiom that inflammation artificially produced is generally much less serious than that which supervenes spontaneously, and that the former disappears with great facility under the influence of antiphlogistic remedies.

Another mode of treatment recommended (particularly by Lisfranc) is the introduction into the urethra of strongly astringent injections, which he maintains to be an "heroic" means of combating old discharges and indurations of the urethra. But, despite the happy audacity with which they have been administered, it will not be prudent to recommend, as a general precept, that they be suddenly employed in large doses. They have frequently produced inflammations so violent as to give rise to serious apprehensions; and, although those inflammations may not have been attended with fatal consequences, they inspire just inquietude. That inconvenience is almost the only one caused by injections when they are strongly astringent; and it is an inconvenience we may always avoid if we are careful to graduate the astringent quality of the injection. We ought to discontinue the use of injections in those cases where they have produced an increase of inflammation, and again resort to them after the inflammation has been subdued.

Although we are not in possession of sufficient data to determine in what manner injections act, it would seem that they contract the capillary vessels, dilated by the influx of blood, and that their action on the urethra is usually similar to that of astringents on the conjunctiva, when we employ them for a chronic ophthalmia. No proof has been adduced that their action is extended to all the coats of the urethra, in such a manner as to produce a permanent contraction; if they diminish the calibre of the small vessels of the urethra, the diameter of the canal should necessarily become more considerable: occasionally they appear to act as excitants, in arousing the indolent inflammation, and rendering it more easy of cure.

Lugol, physician of St. Louis at Paris, states that he has succeeded in curing a great number of cases of old and obstinate discharges by the use of injections of cold water, passed into the urethra after each time that the patient evacuated his urine.

The treatment by purgatives, once so popular, possesses now only few advocates. Their use is founded on this—that there are cases in which we see a strong purgative prove not only useful, but effect a cure. In spite of the eulogiums which were passed upon drastic purgatives by Sydenham, who says “*Curationis omnis ordo in remediis cathartisis vertitar*”—of Boerhaave,

whose praise of them is unmeasured—and of Van Swieten, whose advocacy of them was quite as energetic—practitioners have seldom recourse to them in the treatment of these diseases in the present day. Indeed, many modern authorities assert that the other revulsives do not cure urethritis when they produce purgation. Hunter, whose ideas upon the subject have been copied and paraphrased, asks how we can conceive that an irritation produced in the intestinal tube can cure an inflammation of the urethra? The question he soon afterwards answers himself, in stating the case of a man in whom “a gonorrhœa had been cured by the exhibition of ten grains of calomel, which had produced a violent purgation.” He says, “the calomel, in this case, has not acted specifically, but by a species of derivation; that is, by the production of irritation in one part which acts as a counter-irritant, curing that which exists in another.”

The last method of treating secretions of the urethra proceeding from chronic inflammation (found, as they so frequently are, obstinate and intractable) to which I shall advert, is that which has been most accurately described by Lallemand. I entirely concur in opinion with that learned professor, that we too frequently regard all secretions from this organ as identical, and that too much tendency exists to attri-

bute them to the application of a contagious virus. There can be no doubt that this cause is incomparably the most frequent; but it is equally certain that it is not the only one: the general health of the patient and the existence of cutaneous and other affections have much influence in the modification of this disease. We frequently find cutaneous diseases alternating with an urethritis, which, if it have succeeded to a suspicious connection, we attribute to the existence of a contagious virus, and which, if it have not been preceded by such connection, occasions much perplexity in the mind of the practitioner, particularly if the patient have never previously suffered from urethritis or syphilis.

We are not unfrequently consulted by young men who decidedly affirm that they have never had connection with a female, and yet suffer from urethral affections. There can be no doubt that such statements should be received with hesitation and regarded with suspicion, as a sentiment of shame may, under some circumstances, induce the patient to conceal what he may have been taught to consider a disgrace. Patients, upon slight presumptions, are frequently improperly subjected to a long course of treatment for urethritis; and the practitioner must observe accurately, compare patiently, and study attentively, all the symptoms

that present themselves, or he cannot expect to form an accurate diagnosis.

Though the symptoms of chronic may have much analogy with those of acute discharges, they always differ in this—that, in the latter, the emission of urine is less painful, the erections less obstinate, and the muco-purulent secretion, whilst less abundant, is thick and yellowish. But, to establish distinctive characters between chronic discharges of a contagious character and those which are not so, but have passed into a chronic state, will be found extremely difficult, if not indeed impossible; for the symptoms are found to vary so decidedly in different persons, and in the same person at different times, that it is only by a careful review of all the circumstances of each case that we are enabled to arrive at any thing like certainty. It will, in all cases, be necessary to consider the temperament of the individual; since it is only by making a profound modification of that temperament that we can hope to obtain a cure.

With regard to these chronic discharges, little is known, frequent as is their occurrence: they generally succeed to acute urethritis, and are characterized at first by a disposition purely local; that is to say, by an alteration of the mucous membrane and the cryptæ which open on its surface. They are usually little inconvenient, and are therefore often neglected;

yet the habitual irritation which remains (though in a feeble degree) on the mucous surface is readily exasperated. Either immoderate coitus, or the existence during coition of the menstrual flux, or leucorrhœa, is frequently sufficient to re-establish this discharge when it has some time ceased.

If the disease have long existed, the digestive functions become affected and the whole of the system becomes deranged.

Whatever may have been the origin of urethral affections, the difficulty of cure is proportioned to the period of their continuance. When they become, as they sometimes do, almost habitual, they constitute the despair of patients, the torment of practitioners, and the fortune of quacks. To form an idea of the difficulty which is experienced in procuring a radical removal of this disease, it is sufficient to consider the different modes of treatment which have been practised, to look at the numerous recipes, all infallible, announced in our journals or placarded on our walls, and to reflect on the great variety of treatment which exists among the better practitioners of the present day. One party, having satisfied themselves only of its inflammatory character, repose their confidence in antiphlogistics: another party, regarding it merely as a relaxation of the mucous membrane, have recourse to tonics and astringents: a third party, confident of its

virulent character, find their specific in the gum-resins or cubebs: whilst a fourth, impressed with its syphilitic character, discover their specific in mercury. All these opinions have numbered their partisans, and have all been based upon observations, isolated, it is true, but made with more or less accuracy. The practitioner must, however, expect to find his expectations occasionally disappointed in the exhibition of each and all of these specifics.

Within these last few years, a remedy has been employed which has proved a powerful agent in the removal of chronic urethritis. M. Lallemand was induced to resort to the use of this powerful agent, the nitrate of silver, from failing to obtain a cure by the use of the most accredited remedies. He conceived that an alteration had taken place in the mucous membrane capable of resisting the ordinary means of cure. He supposed that the affected tissue possessed, in some measure, a new organization, and that it was unwise to expect a complete and permanent resolution of the long-standing capillary engorgement, except by a direct, energetic, and profound action, which would produce a permanent change, destroy a depraved sensibility, and modify the vitality of the tissue. The nitrate of silver, then, occurred to him as the only agent from which such a result could reasonably be anticipated.

The success which has attended this treatment of complicated or consecutive discharges ought to induce serious consideration, whether it should not always be tried in cases of chronic urethritis which have resisted those modes of treatment hitherto generally found successful; particularly as the condition of the tissue, in those cases, is analogous to that for which nitrate of silver is now externally applied. Supposing this remedy to be resorted to, the question arises, to what part of the canal should the application be made? Should it be to the fossa navicularis, the situation uniformly referred to by patients as the seat of the painful sensations they experience in the canal? No; for we know that those sensations are almost all purely sympathetic. And, in chronic urethritis, it is not in the fossa navicularis that the secretion is formed which escapes when we press upon the penis at that point. It is true that the accurate observations made by John Hunter and others shew that the pain and inflammation which accompany acute urethritis are situated at that point; but, in proportion as the disease assumes less of an acute and acquires more of a chronic character, we find, if the inflammation do not entirely cease, that there is a tendency to its propagation backwards, until it become sometimes stationary at the curvature of the urethra, or, proceeding

further, is communicated to the neck of the bladder and surrounding organs.

It may be worthy of remark too, that the obstinacy of the disease is much dependent on the distance backwards to which the inflammation has penetrated. Although I am aware that the frequent existence of erosion or superficial ulceration in gleet affections is disputed, yet I think it is sufficiently frequent to justify us in stating our belief that those obstinate discharges which now and then occur may be fairly referrible to this cause. The opportunities of examining these cases after death are not frequent; but when afforded, we almost uniformly find a white spot, like the cicatrix of an ulceration. It is true that it is almost impossible to acquire a certain knowledge of the existence of these ulcerations on the urethra. The nature of the discharge will give us no assistance; for we know no mode by which we can distinguish that pus which is produced in ulceration from that matter which is exhaled from an inflamed mucous membrane. Those ulcerations, when they exist, are always found in that part of the canal immediately under the symphysis of the pubis, occupying the inferior portion of the canal; and are only consecutively propagated to its circumference.

The following case appears to warrant my conclusions. M. A. retained, during a long

period, a chronic discharge from the urethra, experiencing at the same time, as a constant symptom, pain and uneasiness in the fossa navicularis. He was treated, during a year, with injections, the composition of which was varied ; without deriving any benefit from their administration. The surgeon under whose care he had placed himself applied the nitrate of silver eighteen or twenty times to the fossa navicularis, without obtaining any alteration of the symptoms. Pasquier was consulted, and felt assured of the existence of an ulceration under the symphysis of the pubis. He made a single application of the nitrate of silver to this portion of the canal, and in eight days the discharge had entirely ceased.

Observation has shewn that the curvature of the canal is the situation where we most frequently find ulceration in the mucous membranes. The membrane at this point is found thickened and injected ; and the alteration not unfrequently augments as we approach the neck of the bladder. If we sound patients affected with the disease, they testify a vivid sensibility when the instrument arrives at the curvature of the canal ; and this sensibility is occasionally much increased as we approach the neck of the bladder. Indeed, a spasmodic contraction frequently occurs, which for some time prevents the possibility of penetrating into

the bladder. The pain and spasmodic contraction produced by the sound are so considerable, that the presence of the instrument cannot, ordinarily, be supported for more than a few seconds. All these circumstances seem to prove that the irritation in these cases has its principal seat in the curved portion of the urethra; and it is this portion which it is necessary to cauterize. As the canal is not constricted, it will be possible, if necessary, to cauterize the curvature and prostatic portion of the canal circularly; though experience has demonstrated that it will be generally sufficient to cauterize the inferior half of the canal.

It is necessary to recollect that the instrument is not introduced for the purpose of destroying a stricture, or producing a loss of substance; but to modify the vitality of the tissue: and for this purpose it will be sufficient merely to pass the caustic lightly over the mucous surface two or three times. At the moment the nitrate of silver acts upon this membrane, the structure and sensibility of which have been only slightly modified by disease, the pain is vivid and burning; yet less so than we might suppose, were we to judge from the sensibility of the parts, or the apparent suffering of some patients. Their sensations, and the manner in which they describe them, are much influenced by the apprehensions they entertain. They

rarely complain of suffering when they suppose we are only sounding them ; and frequently do not distinguish the cauterization from the catheterism. The pain, no doubt, varies in different individuals, and is influenced by the state of the diseased parts ; but, however painful may be the operation, the pain ceases almost as soon as the instrument is withdrawn from the canal.

The cauterization of the prostatic portion of the urethra produces a very singular effect on the margin of the anus and rectum. At the moment that the nitrate is brought into contact with the mucous surface, the patient experiences, at the extremity of the intestine, a sensation analogous to that which is felt by him at the neck of the bladder—a species of painful shock, which he likens to a severe pinching, or a sharp puncture, and which commences in front of the anus, and extends from thence along the anterior surface of the rectum ; the sphincters and the intestine at the same time contracting. In proportion to the degree of this sympathetic effect on the sphincter or rectum is the desire to stool experienced by the patient, even before the fæcal matter arrives in the rectum. Occasionally, for two or three days, the patient experiences, whilst at stool, a pain in the neck of the bladder, and, not unfrequently, passes some drops of blood by the

urethra. A pressing desire to urine is felt at the moment of cauterization, which frequently returns, and to which the patient is obliged immediately to yield: but by degrees this sensation becomes enfeebled, and returns at periods more and more remote. The first emissions of urine are accompanied by a sensation of heat in the cauterized part, and a contraction which extends more or less to the whole canal; and the last drops of urine are occasionally mixed with blood.

In some hours these phenomena diminish, frequently disappear before the end of the first day, and, in the far greater number of cases, before the end of the second. The discharge generally disappears during the first three days, returns on the fourth, augments on the fifth and sixth, diminishes and ceases almost spontaneously from the tenth to the twentieth day. Thus the secretion is suppressed during the time that the eschar covers the mucous surface, augments when it is rejected, and diminishes as the inflammation decreases. But this new inflammation produced by the cauterization is acute, and has its seat at the surface of the mucous membrane; the other chronic, and affecting principally the mucous cryptæ. This consecutive secretion is never similar to that which has preceded it: sometimes it is more abundant, mixed with striæ of blood; but is

less opaque, less thick, and bears more resemblance to the white of an egg, becoming soon altogether serous.

It is true that cauterization is not an infallible remedy in these cases, that it is occasionally attended with inconvenience, and that it sometimes produces, in three or four days after its application, inflammation of the testicle: and it is not strange that this remedy, applied perhaps on the orifice of the ejaculatory canals, should produce, in irritable subjects, the same effect that other excitants would do under similar circumstances. The irritation sometimes extends to the vesiculæ seminales, vas deferens, and testicle; but these cases of irritation are unfrequent, and not more dangerous than when dependent on any other cause. The effects of all therapeutical agents are various; and the nitrate of silver, concealed as the application is from immediate observation, may be influenced by many circumstances, producing a greater or less difference in the result of the application.

The inflammation produced by cauterization may be inefficient: it will then be necessary to repeat the application. It may be too energetic; and should then be moderated by ordinary means. Lallemand says that, far from seeking to dissimulate with regard to the inconveniences of this remedy, he would endea-

vous to exaggerate them, in order that they may be avoided by the suggestion of the necessary precautions. He states that, nine times in ten, he has cured, by cauterization, discharges of long standing, which have resisted treatment the most rational and varied. There exists this difference between cauterization and other remedies—that its success is more durable, because it acts directly on the diseased tissue, and changes its organization.

Many practitioners have manifested fear about the consequences which may follow the cauterization of the orifices of the ejaculatory duct; but I think that, far from being injurious, it is advantageous to the generative functions, in producing a cessation of that irritation which not unfrequently exists, and extends, more or less, to the vesiculæ seminales and the testicles, determining, in the first, anomalous contractions, and, in the second, exaggerated secretions. But I may here be allowed to remind my readers that the use of caustic, like that of every other powerful remedy, must be attended with the strictest caution, and that its application has, in some instances, been accompanied by alarming effects; but it must also be borne in mind that its successes have been frequently as striking as unexpected, and such as it would be vain to expect from the use of any other agent with which we are at present acquainted. It may,

on the whole, be safely asserted, that, when used with discretion, cauterization may be resorted to with the most perfect safety; for it is not in the well-directed use, but in the ignorant abuse, of the remedy that danger lurks.

Before I terminate my remarks on this subject, I shall make a few observations on these several modes of treatment; comparing the one with the other, and endeavouring to determine the chances of success which may attend the employment of either, and pointing out the cases where each may be used with a probability of success. It is important to know that all have produced cures, and that each has been represented as infallible by those who have exclusively employed it, or who have believed that they have found in their practice sufficient reason to modify the method of employment—that all have occasionally failed, but that the revulsive method and that of the direct application of the remedy have failed more frequently than the antiphlogistic. It is to the organization, and not to the means employed, that these differences must be referred; for a therapeutical agent is similar to itself in all circumstances, whilst the organization varies almost unceasingly. It is upon this principle that was founded the important adage of Hunter—“Whatever may be the method we shall choose, we ought always to be particularly attentive to

the constitution of the individual :” and that of Huknemann, who says—“ It is evident that the name of a disease contributes nothing to its cure, in supposing that diseases may receive fixed denominations ; which is as impossible as to give particular names to each state, which will never again be represented under the same form and the same shadow.” The indication which ought to guide the practitioner, in the treatment of this or that disease, consists alone in the exact investigation of the symptoms, inconvenience, signs, and alterations of health, which form the character of a certain given case of disease.

It has, I apprehend, been shewn, in the remarks which have been made on the symptoms and character of urethritis, that the disease commences in the fossa navicularis ; that it is progressively propagated backwards in the direction of the neck of the bladder ; that the seat of the disease has much influence on its duration ; and that, when it approaches the neck of the bladder, it is necessary to resort, for a removal, to an energetic mode of treatment.

Such, then, is the state of the question with regard to urethritis, and such is the uncertainty in which we are involved in forming our diagnosis of its character ; and I do not apprehend that any beneficial change can occur until

organic chemistry shall have rendered us more conversant with the composition of all secreted fluids.

ORCHITIS AND OPHTHALMIA.

There are two affections which occasionally accompany urethral discharges, on the nature and treatment of which I shall make some few remarks—and these are inflammation of the testicle and of the conjunctiva.

Our ideas of inflammation of the testicle would, I apprehend, be very erroneous, were we to refer it, with some authors, to a “metastasis of gonorrhœa,” or, with others, to a “sudden suppression of the discharge,” and a consequent engorgement of the testicle, produced by the absorption of the virulent matter into the system and its deposition in the affected organs*. The advocates of the latter theory endeavour to re-establish the discharge, with the idea that, when this has been effected, the disease of the testicle will cease.

It is only when the inflammation of the urethra has little intensity, primitively or secondarily, that we ordinarily see engorgement of the

* “Sed nam pariter facilis est a vesiculis in testes morbi transitus? Ab illis in hos, cum vi adstringentum remediorum exitus intercipitur, virulentam regurgitare materiam, eoque tumere ipsos, et ex parte sedem esse gonorrhœa docuit Whartonus.”—*Morgagni*, loco citato.

testicle supervene. That engorgement is extremely rare when the urethritis is very acute.

A stimulus exercised on the testicle, an erotic erethism produced by the presence of a female, together with a prolonged erection, a long walk, excess of coitus, the sudden application of cold to the genitals, astringent injections, violent purgatives, the dragging of the cord when the scrotum is not suspended, each or any of these causes may occasion orchitis. Orchitis is, however, most frequently suddenly manifested. A heavy pain is felt in one of the testicles, rarely in both at the same time, succeeded soon by tumefaction, and the enlargement proceeds occasionally so rapidly, that, in some hours, if the patient be not confined to his bed, but continues to walk or take any fatiguing exercise, the organ acquires a volume double or triple that which is natural to it. The cord, enlarged to the inguinal canal, is sometimes found constricted by the ring and almost strangulated: at the same time the urethral discharge generally diminishes, and I apprehend simply by counter-irritation. It, however, rarely ceases entirely.

Once developed, the inflammation of the testicle presents phenomena which are proper to it, and which owe their character to the structure of the organ.

During the continuance of an urethritis, the

pains and erections which accompany this affection excite directly the testicles and augment their action. We constantly observe that, even when these organs are not really diseased, they are more or less painful on pressure. This sympathy between the urethra and testicles is well marked, too, under other circumstances: they frequently become inflamed by the presence of bougies in the urethra. We see, during the progress of an urethritis, that spontaneous evacuations of spermatic fluid occasions, to a certain extent, cessation of the pain in the urethra, and of the subduing pain in the testicles. Whenever, therefore, the mucous membrane of the urethra becomes affected by irritation or inflammation, the testicles are undoubtedly in imminent danger. If orchitis were always the result of a metastasis, we ought constantly to observe it in a sudden cessation of the urethral discharge; but this is rarely the case.

I have stated that the pain and erections, which so frequently accompany urethritis, influence the testicle and augment its action, and, I may add, that they contribute powerfully to produce an extension of the urethral inflammation. In some happy opportunities, we may almost demonstrate the progression of the disease; we may see the inflammatory engorgement proceeding successively to the spermatic cord, the epididymis, and the testicle.

It may be asked—why, according to this law, both testicles are not more frequently simultaneously affected? and why the right so generally suffers? Do we know by virtue of what law the pulmonary organ, exposed to the action of any morbid principle, is so seldom affected on both sides at once, and to so limited an extent?

The mean duration of orchitis is from thirty to thirty-five days, when it has been discreetly treated, and its most frequent termination is in resolution. Abandoned to itself, or unskilfully treated, it may pass to a chronic state, and be prolonged. Ordinarily, resolution is incomplete; the testicle returns to its original state, but the epididymis remains hard and more or less painful on pressure: this often persists a very long time. It is not rare to find persons who have retained traces of it during the remainder of their lives. It may occur that orchitis, succeeding to urethritis, shall be followed by scirrhous of the organ; but this is very rare. Indeed, in orchitis, the prognosis is usually easy; it does not tend to compromise the life of the individual, unless in a bad constitution.

With regard to the treatment of the disease, there is little requiring mention. The method (counter-irritation) advised by a great number of authors who perhaps have seldom tried it, and which is to irritate the canal of the urethra by means of a sound prepared or not with

matter taken from an urethral discharge, is seldom successful; at least, if we refer to the testimony of those persons by whom it has been applied. I believe that the curative means ordinarily resorted to are equally applicable to that disease, whether accompanying urethritis or not. There is, however, one method of treating this affection from which I have derived the most extraordinary and unexpected success—it is from the administration of the balsam of copaiba, even during the most acute period of the disease. Indeed, in either the acute or chronic stages of this disorder, either when the organ has much increased in volume or when accompanied by violent pain, the same happy effect has attended the exhibition of this medicine in the great majority of cases in which it has been employed. It has been found prudent generally to exhibit it in doses of a drachm, three times daily, in conjunction with opium, for the purpose of preventing the violent purgation which it sometimes occasions, and which not unfrequently interrupts the good effects of the copaiba. There is an old method of treatment, still in use, which consists in applying upon the testicle a strongly astringent cataplasm. This treatment sometimes succeeds, but only when it is employed actively from the commencement of the disease: if introduced later, it

fails, and exposes the patient to induration of the testicle, requiring great care and attention for its removal.

We cannot state positively whether ophthalmia be produced by metastasis or not, or whether it be, as I think most probable, the result of an inoculation caused by the patient's rubbing his eyes with fingers smeared with the matter of contagious urethritis*. It has been

* "Il y a long-temps que l'on a constaté qu'une ophthalmie tres aiguë, avec flux puriforme de la conjonctive, accompagne souvent la gonorrhée; et comme quelquefois l'écoulement est notablement diminué ou suspendu pendant la durée de l'ophthalmie, on a conclu que cette dernière provenait d'une métastase de la gonorrhée. Nous n'avons nullement l'intention de contester la possibilité du transport d'une maladie toute entière, avec les symptômes qui la caractérisent, d'un lieu dans un autre lieu fort éloigné: personne ne peut nous dire ce que la nature peut ou ne peut pas faire: il s'agit seulement d'apprendre, par l'observation la plus exacte, ce qu'elle fait réellement. D'un assez grand nombre de cas de cette espèce où nous avons pu compter sur l'intelligence des malades et l'exactitude de leurs remarques, nous avons pu constater que le hasard, ou quelque accident, avait porté le malade à toucher fréquemment, ou long-temps de suite, le bord libre des paupières, apres avoir souillé recemment ses doigts avec le flux de la gonorrhée; et l'on conçoit combien la chose est facile, et pourrait être commune. Or lorsque nous avons pu donner à des remarques de cette espèce toute l'authenticité desirable et possible, nous n'avons rien noté de particulier dans les phénomènes et la marche de la maladie, rien que ne fût commun aux cas où l'on croit pouvoir attri-

observed that ophthalmia commonly makes its appearance during the acute state of urethritis, while orchitis seldom appears, except when the urethral inflammation is slight: most frequently one eye only is affected; sometimes both. The urethral discharge is generally more or less diminished or completely suppressed, as in the case of engorgement of the testicles, but sometimes continues its accustomed course. The inflammation commences in the conjunctiva, which we see injected and tumefied. The tumefaction sometimes proceeds to such an extent that the membrane forms a circular collar around the cornea, and causes a projection of the eyelids, the cornea itself participating in the disease; and pus is produced between its laminae, rendering it more or less opaque. In certain cases (which happily, however, are rare) the disease presents an extreme acuteness, which we are un-

buer l'ophthalmie à la métastase gonorrhôïque." Giving every credence to facts which have been adduced to establish the existence of the disease by metastasis, he says—"En accordant aux observations sur lesquelles on se fonde toute l'exactitude possible et la force démonstratif qu'elles n'ont pas, voudrait-on en conclure que l'origine métastatique et l'inoculation directe de l'ophthalmie gonorrhôïque ont également lieu? Mais alors il faudrait signaler quelque différence entre les cas de l'une et l'autre espèce. Qui pourrait se persuader qu'avec des conditions tellement différentes le résultat dût être absolument le même?"—*Delpech, Clinique Chirurgicale.*

able to stem by the most active treatment. The globe of the eye participates in the inflammation, is distended, and, in consequence of the resistance which is offered by the sclerotic, occasions the most frightful pain. The brain even may be disordered, if the spontaneous rupture of the eye, or puncture, do not terminate the affection; and loss of the eye is the inevitable consequence of this termination. When there is merely opacity of the cornea, there remains some chance of success, either by means of external applications or by the operation for artificial pupil.

It may possibly be found advantageous to endeavour to reproduce the discharge from the urethra. This must be considered as a secondary means, on which little reliance can be placed, and should not be employed until the inflammation has been subdued by active treatment. In the other complications which are observed in the course of urethritis, we see nothing more than inflammation extended to those parts in relation to the urethra, either by continuity or sympathy; or inflammations accidentally developed in consequence of peculiar predispositions in organs at a distance, and which we ought to consider more as coincident with, than as dependent upon, the urethral affection.

I am aware that there exists in the minds of

medical men an impression opposed to the opinion that the ophthalmia, of which we have been treating, is produced by inoculation, and I know that Mr. Veitch has produced a strong conviction that it is caused by metastasis; but I apprehend that the two cases related by Delpech, and those mentioned by Lawrence and Wardrop, are sufficient to prove, at least, that inoculation is a cause of such ophthalmia. In one of those cases the ophthalmia existed in a young man who had been affected by contagious urethritis, and the other was a servant maid who applied to her face a sponge which had been used by a young man suffering from contagious urethritis, and who had never herself been affected by that disease.

I shall discuss shortly the validity of this opinion. The discharge does not always cease upon the appearance of ophthalmia, or orchitis, and most frequently those affections are super-added to the urethral affection. The inflammation and morbid secretion are reproduced by the irritation of the canal, without influencing sensibly the accidental diseases. The urethral discharge reappears sometimes when the other affections diminish; but as frequently the two diseases proceed towards a cure together. Indeed, of late, the theory to which I have alluded, namely metastasis, has been less vigorously supported; and we now feel convinced that

the affection of the testicle, at least, is produced simply by the extension of inflammation occasioning, by its intensity, a temporary cessation of the discharge.

CHAPTER V.

CATHETERISM.

THE remarks which I think it necessary to make on the introduction of instruments into the urethra will be very general; for the instructions contained in all our elementary works of surgery are so simple, that to enter into detail on the mode of introduction under ordinary circumstances is unnecessary.

The time when instruments for exploring the urethra were invented appears not well determined. Troja and Lassus state that the sound with two curvatures, the invention of which has been referred to Petit, had been in use two thousand years before his time by the Greek surgeons. Lassus had seen, in the Museum of Portici, near Naples, this kind of sound, which had been discovered in the ruins of Pompei; it, as well as all the surgical instruments of the Greeks, was of bronze; it had the same form, the same length, and the same diameter as that of Petit, and differed only in this—that, in place of two lateral holes, near its

extremity, it had only one, which was on the concave portion of the sound and very near its extremity. Paulus Egineta*, who lived in the early portion of the seventh century, in speaking of diseases of the urethra, and of the treatment which they require, says—that when ulcerations exist in the urethra, we should introduce into the canal a quill, or a tent made of linen, and covered with some dessicative ointment.

We may explore the urethra and bladder in man—first, by the aid of instruments more or less curved and inflexible; secondly, by instruments straight and inflexible; and, thirdly, by flexible instruments.

The curved instruments are those which, until recently, were almost exclusively used, and are still the most generally employed.

In introducing an instrument into the urethra or bladder, it is necessary to recollect that the two opposed parietes of the urethra—the superior and inferior—differ singularly as to their configuration, and that we cannot indifferently follow the one or the other with the beak of an instrument. The inferior portion is yielding; for neither along the penis, nor at the height of the scrotum, nor beneath the pubic symphysis, is it supported by any thing solid. In gliding along the canal, the beak of the sound may

* Liber vi, cap. 71, p. 201.

easily enough push before it the lining membrane of the urethra ; for along its surface we meet, in old men, inflections of the membrane (resulting from its flaccidity), which occasionally have a tendency to arrest the progress of the instrument. Those inflections are, however, principally longitudinal, and they cannot arrest the passage of an instrument. Some orifices of mucous follicles, and among others those of the glands of Cowper, are, according to general opinion, susceptible of receiving and arresting the beak of a sound, especially if it be of a small size. Lastly, at the level of the bulb and in front of the contour of the neck of the bladder, on the sides of the verumontanum, there exists on the inferior surface marked depressions, the orifices of which are presented towards the external orifice of the urethra : against these the beak of the sound passes, and is by them occasionally prevented from making further progress.

If we examine, by means of dissections (attentively made) false passages formed in the urethra, during life, or after death, in subjects submitted to catheterism, we find that they are produced by the rupture of the inferior parietes of this canal, and that the greater number of those passages exist either at the situation of the depression I have pointed out or at the bulb. The disposition of the superior part of the urethra is infinitely

more favourable as a conductor for instruments in their passage along the canal than the inferior. Sustained in front by the corpora cavernosa, and behind by the pubic symphysis, it presents great firmness; and we find only longitudinal replications, which are removed by the distension produced by the instrument; and no obstacle is here presented to its progress: no depression exists here under ordinary circumstances; there is no projection of the prostate into this portion of the tube; neither do we find many follicles, either isolated or grouped; nor any considerable orifice. I limit myself here to these succinct indications concerning the anatomical disposition of the urethra, having entered largely into detail when describing the anatomy of this organ.

It results from the preceding remarks, that, during the operation of catheterism, the practitioner should with constant attention follow the superior, and with an equal solicitude avoid the inferior, parietes of this canal; and this with a curved instrument is found to be extremely difficult. If, in its progress near the bladder, the instrument be arrested, and we are unable to penetrate further, instead of applying force for the purpose of overcoming the obstacle, we ought to suspend all pressure, and by careful examination establish the relation of the instrument with the canal.

Despite the contemptuous denial, made by some authors, of the existence of spasmodic constrictions of the urethra, and of the obstacles which they present, spasmodic constrictions really exist, and ought to fix the attention of the surgeon. Occasionally, in the operation of catheterism on irritable subjects, we find that the sound is apparently grasped and held with force by the parietes of the canal, so as almost to prevent the advance or retreat of the instrument. At other times, although in the spongy portion of the canal no resistance may be offered, yet, from the pain and sensibility existing beyond that point, the beak of the sound, after having arrived at the bulb, is arrested at the commencement of the membranous portion of the canal, into which it is prevented from entering by involuntary and continued contractions of the perineal muscles. The fleshy fibres of the muscle of Wilson appear then to perform an active part, and contribute to the elevation, as well as the constriction of the membranous portion of the canal and of the neck of the bladder. If we apply the left hand on the perineal region, near to the anus, and with the other press lightly upon the sound, it is easy (if a little tact be possessed by the operator) to distinguish the oscillation of the muscles, and to appreciate its effect. At each instant of muscular relaxation the instrument re-

covers its liberty, and, if pressed upon, passes onwards; but is again immediately arrested by a return of the contraction and rigidity.

In this case we have only a transient obstacle, which is generally overcome without much difficulty. We should, during some moments, limit ourselves to support the instrument in contact with the obstacle. The muscular fibres contract at first with more or less force, in consequence of the excitement which is produced by the presence of the instrument: they are, however, soon fatigued—become relaxed—the passage is free, and the operation is achieved. By distracting strongly the attention of the patient, we may frequently suspend the contraction of the muscles under the influence of volition, and thereby produce a free passage for the instrument. If, however, the spasm should be obstinate, the introduction into the rectum of a mixture of equal parts of simple cerate and extract of belladonna has proved highly effective in lessening the muscular action. Lallemand states that the acetate of morphia, either as a lavement or introduced into the urethra, has been found more promptly efficacious than any other means of which he is aware.

Although I believe the seat of spasmodic constriction to be in that portion of the canal so nearly, and in some cases so entirely, surrounded by the *acceleratores urinæ* and Wil-

son's muscles, yet, in highly irritable urethras, it is not unfrequently found that the engorgement of the mucous membrane is so considerable as to arrest the instrument at two, three, or four inches from the orifice, and to simulate the character of true stricture. We have seen, and have ourselves taken casts at these different situations; the patient having no other obstacle than spasmodic contraction of the urethra. The wax is then shewn elongated like a crow quill; and yet, immediately afterwards, a large sound may be often introduced without difficulty.

When there exists in the urethra an intense plethoric irritation, or an exquisite sensibility, which renders the introduction of the sound either insupportable or excessively painful, we ought to postpone the catheterism. In spite of the repletion of the bladder, in spite of the almost insupportable desire to urinate with which the patient is tormented, it will then be imprudent to insist on an operation which will be attended with difficulty, and which will rarely succeed; while the attempts we make are calculated to aggravate the pain and inflammation.

Abundant capillary abstraction of blood from the perineum, and the use of warm baths, prolonged during three or four hours, is here the practice indicated.

It will be seen that it is highly important to be enabled to distinguish the two opposite states

of nervous excitation and inflammatory irritation : the one, ordinary enough in subjects who are feeble, spare, and susceptible, requires the employment of narcotics ; the other, more common in robust individuals, requires to be combated by the aid of blood-letting and emollients. Forced catheterism is, in either case, eminently dangerous, and ought to be rejected by every well-informed practitioner.

Some surgeons are accustomed, at the slightest obstacle, to introduce into the rectum the indicator finger of the left hand, with the intention of sustaining and directing the beak of the sound. This manœuvre is sometimes dangerous, and should always be employed with caution ; for, in distending the rectum, in elevating the prostate, in bringing the perineum nearer to the symphysis pubis, we evidently present to the beak of the sound the inferior parietes of the urethra, with the depressions and orifices of the follicles which I have already described. The introduction of the finger into the anus should only be resorted to for the purpose of ascertaining the state of the urethra, and to assure ourselves of the exact situation of the instrument. The knowledge which we often obtain in this manner is frequently exceedingly valuable ; but, while we are making this examination, it is absolutely necessary that the instrument should be at rest. If we feel

that the extremity of the instrument is situated immediately under the integuments in the perineum, and near the anus, we may be assured that it is in the cul de sac of the bulb; we ought then to withdraw it a little—elevate it—bring it near the concavity of the symphysis, and, after having placed its extremity against the superior parietes of the urethra, to follow with exactness this direction, until it enters the bladder.

In whatever period of the operation of catheterism we experience any of the difficulties already indicated, and in whatever portion of the urethra the instrument may be arrested, the first duty of the surgeon is, to suspend all active exertion, and to leave the catheter at rest; to examine attentively the general direction of the instrument, that he may be in a condition to establish its relation with the parietes of the canal, and to discover against which of them it is supported. No circumstance should be neglected that can assist us in forming an exact idea of the nature of the obstacle, and of the position which it occupies: we must explore with care the perineum and rectum; and, at last, if the patient be tranquil, impress upon the instrument a slight movement, in order to distinguish at which point it is free, or grasped, in the urethra.

I conceive that, before we have ascertained

the nature of the obstruction offered to the performance of the operation, any further attempt to pass the instrument will be made at much hazard, and will most likely expose the patient to useless pain, if not serious accidents. If I may be allowed the expression, the surgeon ought to have his eye at the extremity of the instrument he conducts, that he may see at each moment the progress he is making, and the nature of the obstructions he encounters. Whenever the instrument is arrested, it is necessary to withdraw it a few lines, for the purpose of disengaging the beak, and then, according to the case which presents itself, to give a movement either of elevation or depression, using a slight pressure to assist it to pass into the bladder.

There is certainly no operation which requires for its successful performance a more perfect anatomical knowledge of the parts upon which we are operating, or a more constant attention, to feel and to direct, with delicacy and caution, the instrument which we are using, than that of catheterism. So that, although it will not be expected I should pass through a routine description of the manner of introducing the ordinary catheter, yet I think it necessary to describe the manner of introducing straight instruments into the bladder.

STRAIGHT INSTRUMENTS.

The use of straight instruments is not new in surgery; for they have been discovered in the ruins of Herculaneum and Pompei. Khalaf-Ebn-Abbas-Abu'l-Kasem, generally known by the name of Albucasis, who died in 1122, and who wrote a work on the operations of surgery, which is one of the most precious relics of the age in which he lived, gives a representation of a straight instrument; but there are no directions for its use. But it is evident that they were in use in his time; and as there exists so much doubt as to Albucasis having written another work, in which allusion is made to this instrument, we may still more confidently support the opinion. Friend has, I think, proved that the work which has commonly been attributed to Alzaharavius*, who is supposed to be a different person from Albucasis, was only a part of a great work of the latter. Lieutaud, who lived in the middle of the eighteenth century, expresses himself thus:—"But we may avoid this operation (puncture of the bladder), always dangerous, and often fruitless, because it does not remove the cause of the disease, in providing ourselves with a straight sound, solid

* Libri Theorici nec non Practici Alzaharavii, in fol. Aug. Viad. 1519.

or hollowed. I can assert, from the knowledge I have of these parts, healthy or diseased, that there is not any case, if we exempt that of stone existing in this canal, which can prevent a straight sound, conducted by a hand a little practised, from entering into the bladder." Since that period, they have been used by men of distinguished character, and have acquired an ephemeral reputation.

In recent times, Amussat has devoted much time, and exhibited much ingenuity, in endeavouring to prove the ease with which the urethra may be rendered straight—an opinion which is, to a certain extent, correct, and of which I have taken ample notice in an early part of the present work. Some years before, in the Gazette of Salzburg for 1813, straight instruments were particularly described and recommended by Gruithuisen. Larrey, Civiale, Lisfranc, and Cloquet, have also resorted to the use of a straight sound; and it is to the reputation of those men the instrument now owes its occasional employment.

I have mentioned some of the difficulties experienced in the use of sounds, and particularly the tendency of a curved sound to involve itself amongst some of the obstacles existing on the perineal parietes of the urethra. These difficulties may, to a certain extent, be avoided by the use of a straight instrument; for, if we

give the urethra and pelvis a suitable direction, we may place the former nearly on the same plane with the neck of the bladder. A straight instrument may then be introduced with almost as much ease as a curved one, and, in certain morbid states of the urethra, with more facility. The curved sound is found not to empty the bladder; for, once introduced into this organ, its beak commonly touches the superior parietes: but if we use the straight sound, the bladder is completely emptied. No foreign body, however small, can remain in the bladder undetected by the straight sound, the beak whereof may be with facility directed by the operator into all the regions of the organ.

In the use of straight instruments, it should be borne in mind that, when we introduce this species of sound into the bladder, the penis should be inclined towards the ground; because, in proportion as the bladder is distended with urine, its neck mounts up behind the pubis. In introducing a straight instrument, it is necessary the penis should be grasped and supported with the left hand, and should be elongated in such a direction that the anterior curvature of the urethra may be effaced. To effect this, the penis must form, with the axis of the thighs, when the patient is in an erect position, an angle of forty or forty-five degrees; the sound is then passed into the canal, along which

we push it gradually as far as the bulb, where it is commonly arrested. If we force the instrument in that direction, it will push before it the cul de sac of the bulb, which it will pierce, and, after having destroyed it, will glide under the integuments as far as the rectum. It is therefore necessary that, when the instrument has arrived at that point, we should give it another direction. To effect this, we withdraw it a little, in order to disengage the beak, and depress the pavilion until it is almost between the thighs of the patient, by which manœuvre we elevate the opposed extremity against the symphysis, and may then push it gently forward until the instrument enters the bladder. This part of the operation is the most delicate and difficult. If, after having depressed the instrument, obstacles are still presented, it will be requisite to rest, to examine the parts and to ascertain if the beak of the sound be situated in the cul de sac of the bulb, involved in some follicle, or obstructed by the triangular ligament. In either case, it must be withdrawn a few lines, and placed in another position, and the beak must be more or less elevated, according to the situation in which it is arrested.

Catheterism with a straight instrument is undoubtedly, in a great majority of subjects, more delicate and difficult to practise than that which is performed with a moderately curved

instrument. Indeed, notwithstanding the almost straight direction of the urethra, and the facility with which its posterior curvature may be removed, by a straight instrument the operation is seldom effected without bringing the instrument into collision with the posterior portion of the canal. Thus, catheterism with a straight instrument is generally more painful and more difficult to support than with a curved one. Yet, if the canal be free, and the rules I have given be attended to, we shall be less exposed to make false passages than in using a curved instrument; for we may always avoid the obstacle formed by the bulb, and may more easily direct the beak of a straight than a curved sound, and disengage it with less difficulty when involved in any portion of the canal. I think, however, under all circumstances, when no special indication occurs, we ought to select for the operation instruments moderately curved*, rather than perfectly straight; for, although a practitioner tolerably expert in the performance of the operation will, under ordinary circumstances, experience little difficulty in the introduction of either instrument, yet, if it be shewn that the pain occasioned in the one case is greater than in the other, the patient's feeling should be deemed of more importance than

* See diagram at the end of the work.

a servile obedience to the dominion of fashion, or a restless desire of innovating—from which, perhaps, few minds are entirely free.

Whether the instrument introduced into the bladder be of a curved or straight form, its position in that organ must be carefully noted. If circumstances render it necessary that it should remain for some days in the organ, it should not be too profoundly introduced, or it may, by being constantly in contact with the sides of the bladder, occasion ulceration of its parietes. It is more prudent, after introducing the instrument, to withdraw it gently, until we find that the urine has ceased to escape through it; and in this position it should be retained. We shall, by this method, certainly avoid the danger I have named.

Now, simple and easy as the operation may appear when the urethra is free, whenever the canal presents an obstruction, difficulties arise against which we can establish no general rule; for, as has been judiciously remarked by Deschamps, the best precepts which may be laid down regarding the use of instruments are insufficient; and it is not in books that we should learn to sound; so that, however precise may be the directions given on the use of straight or curved instruments, they will be almost useless, unless the operator has acquired a certain portion of dexterity by frequent exercise upon

the dead body. Perhaps, in practising upon the subject, no method presents so much facility in acquiring the necessary tact as the following: let the thigh of one side be removed, the urethra, being then made visible, the operation is performed: the operator immediately sees the points at which obstacles are presented and the mode by which they may be most easily surmounted.

Another circumstance which must be borne in mind is, that the patient should be permitted to urinate as seldom as possible. If this be not observed, the bladder will easily lose its capacity; for all containing organs have a tendency to accommodate themselves to the quantity of substance they habitually contain.

PART II.

CHAPTER I.

STRICTURE.

DEFINITION, ORIGIN, CLASSIFICATION, SITUATION,
AND SYMPTOMS.

RETENTION OF URINE.

DEFINITION.

THE term stricture, which has been long used in the science of medicine, has received various definitions. Sir Charles Bell has defined stricture to be that state of the urethra in which the canal has lost the faculty of dilating. Wilson makes stricture to consist in a morbid change of action or structure, by the existence of which one portion of the canal has become narrower than in its natural state. Lisfranc describes stricture as that state of the urethra in which the canal, for a greater or less extent, cannot resume its ordinary capacity, in consequence of the existence of a pathological condition.

I include in the term stricture all those diseases of the urethra which are situated either on the surface or in the substance of the mucous

membrane lining the urethra, or in the cellular tissue by which that membrane is surrounded ; and which, by their presence, lessen the diameter of the tube, and present an obstacle to the free excretion of urine.

ORIGIN.

The causes to which I conceive stricture may be generally attributed are—First, an engorgement of the mucous tissue, accompanying the acute state of inflammation, and generally abating as that subsides. Secondly, induration succeeding to inflammation; generally of a chronic character ; and this is the most frequent cause of stricture, producing the disease, as I believe, in at least nine cases out of ten. Thirdly, adhesions of the parietes of the canal, generally succeeding to ulceration of the mucous membrane,—producing a more or less perfect septum, which is, by some authors, termed valvular or bridle stricture. The production of this latter species of stricture was referred, by Home, to a constriction of a circular muscular fibre, the existence of which he assumed. As he afterwards abandoned his theory, I shall make no further allusion to this opinion. Other writers on stricture have attributed the production of this septum to false membranes—an opinion which necessarily implies the organization of these membranes—a conclusion the

fallacy of which I conceive I have already established. I submit the following explanation of the production of this species of stricture. In the state of rest, the parietes of the urethra are in partial, and, during inflammatory engorgement or ulceration, in almost complete contact. At this period adhesion is rapidly effected; and, although the excretion of urine has necessarily a tendency to prevent the entire occlusion of the canal, yet, as the morbid disposition still remains, the organization becomes gradually more perfect, and eventually the urine, instead of producing a complete rupture of the septum, destroys a portion only, leaving the remainder, like a valve, stretched across a part of the canal. Fourthly, the existence of fungi or carnosities on the internal surface of the tube, which have a disposition to interfere with the excretion, and occasionally to produce retention of urine.

CLASSIFICATION.

To one or other of these causes may be attributed, I believe, the vast majority of strictures; but a different classification of the disease has been made by some authors. The following is the classification of Daran:—First, Stricture produced by the contraction of the fibres of the lining membrane of the urethra—an opinion which, like that of Home, is perfectly untenable; for it would imply mus-

cularity, where no muscular fibre has ever been demonstrated. Second, by callosities and cicatrices. Third, by carnosities or excrescences, projecting into the canal. Fourth, by callous ulcers, occupying the excretory canals of the lacunæ of the urethra. Fifth, by tumefaction of the verumontanum. Sixth, by induration of the prostate. Seventh, by fungosities of this gland. Eighth, by concretions of a particular character.

Desault admits three kinds of obstacle to the excretion of urine: the first in the thickness of the parietes of the canal; the second at the exterior of the parietes, as enlargement of the prostate and various tumours external to the canal; the third in the interior of the canal, as fungosities.

Nauche states that strictures are dependent—first, on a violent inflammation of the urethra; second, on spasm of some part of this canal. Some authors do not admit that contraction or stricture of the urethra can be produced by spasm; but that such an effect is produced is nevertheless clearly demonstrated. If catheterism be performed in a healthy urethra, the instrument is sometimes arrested and compressed so as to render it impossible, for the moment, to pass it more profoundly or even to withdraw it. There can be no question, I think, that this must be produced by a pure and simple spasm. But a spasmodic stricture may

also be occasioned during an acute or chronic inflammation of the parietes of the urethra. The irritation of the mucous membrane is transmitted to the muscular fibres surrounding the posterior portion of the tube, and induces an instant spasmodic contraction of those organs; so that the parietes of the urethra are firmly applied the one against the other. Third, on a change of structure of the canal. Fourth, on a disease existing at the exterior of this conduit, and which compresses its parietes. To these several kinds he has attached the terms inflammatory, spasmodic, organic, and symptomatic stricture. Wilson describes three species—the spasmodic;—the stricture, properly called;—and that which depends on disease of the parts contiguous to the urethra. Samuel Cooper distinguishes three species—the first permanent, produced by an alteration of the structure of some part of the urethra; the second depending on the simultaneous existence of permanent stricture and spasm; and the third is the true spasmodic stricture. Beclard divides stricture into two species—first, the inflammatory, which comprehends the dilatable of Sir Charles Bell and the spasmodic: second, the permanent or organic, which includes six varieties—the septum, or bridle, or valvular stricture; the callous or irregular stricture (that in which a great extent of the canal is found contracted, and in which the submucous and

spongy tissue are affected with induration); the stricture with ulceration, carnosities, and vegetations; and that which depends on a varicose state of the veins of the submucous cellular tissue. Ducamp describes stricture as depending—first, on the engorgement caused by acute inflammation; second, on induration succeeding to chronic inflammation of the parietes; third, on “septa;” fourth, on carnosities.

SEAT.

The most frequent seat of stricture has not been well determined—an uncertainty caused, as I believe, by the greater length of the urethra in some persons than in others: the depth from the orifice, and not the particular portion of the canal, having been taken as the criterion. In a hundred and seventy-three cases which I have selected, the disease was seated at the following distances from the orifice of the urethra. In nine the distance did not exceed an inch, in eight from one to two inches, in thirteen from two to three inches, in eleven from three to four inches, in ninety-eight from four to five inches and a half, in forty from five and a half to six and a half inches, in ten from six inches and a half to seven and a half. It is, I submit, quite evident that in all of these cases the disease, when at a greater distance from the orifice than four inches and a half, was seated either

in the neighbourhood of the curvature of the urethra, or between that point and the prostatic portion of the canal, and that the difference in the admeasurement was dependent on the length of the organ. Soemmering says the seat of stricture is especially at the posterior part of the urethra, in the vicinity of the bulb; rarely in front of this, and never in the part of the canal enveloped by the prostate. In the latter assertion, however, he is in error: this will be evident on the perusal of two cases which I have introduced from Lallemand.

If the question were put, why is it that the disease fixes itself at this portion of the canal? I should find much difficulty in giving any satisfactory reply. The seat of acute or primitive urethritis, which has succeeded to a contagious connection, is uniformly at a point much anterior to the curvature of the canal; but, as stricture is, in a great majority of cases, produced by chronic urethritis of long standing, and as this species of inflammation has almost invariably a tendency to be propagated backwards, and to become stationary in the neighbourhood of the membranous and prostatic portions of the canal, it is there that we should expect to find stricture existing. At the moment when acute inflammation of the mucous membrane of the urethra is approaching to a chronic state, it diminishes in intensity and extent, and be-

comes concentrated on a particular point apparently more favourable to its existence. This, however, occurs in all inflammations which pass from an acute to a chronic state : they seem to gain in profundity what they lose in surface. It is now propagated to the subjacent parts, changes their mode of nutrition, alters, consequently, their texture, and produces either ulcerations or (more frequently) adhesions, or depositions of concrescible matter, which augment their thickness and deprive them of their natural elasticity, ultimately producing a tissue of a fibrous character. Here, then, are produced engorgements and indurations of the parietes of the canal, which lessen its calibre. In a few words, then, when the urethra is the seat of inflammation of an acute character, that inflammation is rarely found to occupy a situation posterior to the fossa navicularis. Wherever mucous membranes become affected by inflammation of this description, it is almost invariably of limited extent, so long as this affection continues in the urethra ; and the space it occupies is inconsiderable. Two points are thus laid down—first, that the anterior part of the urethra is its seat ; and next, that a small portion of the membrane only is affected. The character of chronic inflammation affecting these membranes is essentially different, the extent it occupies is more considerable, and its

character decidedly erratic. That inflammation of the canal principally affects the lacunæ which are found there; and, as these lacunæ exist in much greater numbers at and beyond the curvature than in any other situation, it may be reasonably supposed that in that region of the canal inflammation would possess more obstinacy than in the other portions of the canal. Although strictures may be seated upon any portion at least of the spongy part of the canal, one situation is more frequently affected than any other; it is the point where a junction is formed by the membranous and bulbous portions.

Whether the mode to which I resort for the purpose of explaining the great frequency of the development of stricture at this point be satisfactory or not, I must still believe it to be correct. This point too is, in the natural state, the narrowest portion of the canal; and, during erection of the organ, it forms the summit of the angle which is formed by the penis: this is, then, of all situations, the most irritated, and consequently the most disposed to inflame, and to become the seat of induration and stricture.

When there are many strictures, it is always found that one is more considerable, and that its orifice is much smaller, than the others; and this is, ordinarily, the farthest removed from the neck of the bladder. There is no difficulty in

explaining this circumstance. The first stricture is developed at that point where the chronic inflammation has been for some time established, and where it has produced induration. This stricture occasions a gradually increasing obstacle to the evacuation of the urine: the pressure occasioned, and the irritation produced in the portion of the canal between the stricture and the neck of the bladder, by the presence of the urine, excite inflammation which generally terminates in the production of a second stricture; and so on occasionally to a third and a fourth.

In the present state of our knowledge of diseases of the urethra, and of our present method of treating those diseases, the knowledge of the situation of stricture is of much importance: but in the proposed method of treatment it is not so; for it is necessary to introduce an instrument, to explore the canal and establish the depth and character of the stricture, before we proceed to apply the remedy. Indeed, all that we gain at present by this knowledge is, the organization of the particular point, by which we are enabled to determine how that organization can best be altered.

Stricture, then, may depend on hypertrophy of the mucous tissue alone, of the subjacent cellular tissue, or it may affect both simultaneously. It, however, more frequently affects

one primitively, and is afterwards communicated to the other. The canal may become nearly obliterated by a simple thickening of the mucous membrane alone; but, wherever may be the seat, whatever may be the form, the nature, or the age, of a stricture of the urethra, the canal is never entirely obliterated; a communication always exists between those portions of the canal anterior and posterior to the stricture: and if this point of communication be ever interrupted, it is only momentarily and by a foreign body. We have numerous instances, in the nasal canal, of the thickening of the membrane by which it is invested. Similar effects are stated by Andral to have occurred in the bronchia, by Desault in the rectum, and by Patissier in the colon—the submucous tissue appearing to be unaffected by the disease. In the greater number of cases, this chronic disease begins in the submucous cellular tissue, or the adherent portion of the mucous tissue; in consequence, frequently, of an inconsiderable irritation of the free surface of the mucous membrane: and here inflammation commences, as in other tissues, by the exhalation of concrescible lymph, or serum, into its cells. Sometimes the inflammation is first established in the cellular tissue, at other times in the lining membrane, and, in many cases, when the irritation of the mucous membrane has entirely dis-

appeared, it is discovered that the irritation has slowly and profoundly modified the cellular tissue which is contiguous to the membrane. This cellular tissue remains diseased, is hypertrophied, and produces, frequently after many years, those indurations on which strictures are so often dependent. This is how I account for the production of those strictures which do not become evident until some years after the disappearance of the discharge from the urethra. In this affection, if not soon arrested, the tissue becomes more and more indurated, and all vestiges of a mucous character disappear; and it then presents a white indurated mass, without traces of organization, exhibiting almost a scirrhous appearance.

SYMPTOMS.

Of the symptoms of this distressing disease no more classical description is to be found than that of Ducamp. "If we," says that author, "interrogate the patient with care, we shall learn that he has had one or many attacks of gonorrhœa, that the one which preceded the stricture was indefinitely prolonged, that it was more or less frequently renewed, and that the following description would be generally applicable to his case:—'I have had much difficulty in arresting the discharge of my last gonorrhœa, though it was very trifling; my linen was ha-

bitually covered with small greenish spots; I have felt a sense of weight near the anus, and irritation along the canal of the urethra; these symptoms were exasperated by the slightest excess, either in regimen or in sexual intercourse; the latter especially increased the discharge, and sometimes rendered it so abundant that I thought I had contracted a new gonorrhœa; sometimes all the symptoms disappeared, and I believed myself cured; but this belief was of short duration, for I again felt slight heat in passing the urine, and the jet became less voluminous, less regular.' ” Having satisfied ourselves, from this description, of the probability of the existence of stricture, we, with much care and caution, introduce a bougie, and our diagnosis is established.

RETENTION OF URINE.

Whatever be the seat of stricture, or the symptoms by which it is characterized, its effect is uniformly to produce a retention of urine, which is more or less complete as the obstruction is more or less developed. This is the certain effect; but the time at which that effect is produced varies much: we find, in some persons, a retention of urine from stricture succeeding in a few weeks, or even days, to an inflammation of the canal; whilst, in others, obstructions have existed for two or

three, or more, years without offering any sensible interruption to the passage of the urine.

SYMPTOMS.

The manner in which the progress of the disease is generally manifested is as follows:—The urine begins to escape by a jet, which gradually becomes smaller, bifurcated, and spiral; the patient urines slowly, but experiences little suffering, except a slight scalding in its passage and a weight in the perineum. The jet becomes progressively more delicate and less strong, and the patient occupies more time in urining, though a smaller quantity is evacuated at each period. The desire to urinate is now felt more frequently and strongly; the patient is obliged to get up three or four times during the night; the discharge of urine is accomplished only by considerable and sustained efforts, and is accompanied by severe pain and tumefaction of the penis. If, after having urinated, the patient further renews his efforts, he procures a further discharge—a proof that the bladder was not emptied during the previous effort. If he has allowed much time to pass without urinating, he experiences a violent and nauseating pain in the groin, and an obtuse pain above the pubis; and, if he place his hand on this region, he easily distinguishes a hard, resistant tumour, formed by the strongly distended bladder.

Pressure upon this tumour always occasions pain, and generally produces an immediate disposition to urine. In this state of the disease, the slightest fatigue, or the least excess, may entirely suppress the evacuation of urine, and place the patient in much danger. The difficulty to urine is frequently so considerable, and the jet so feeble, that the urine, instead of being ejected to some distance, falls vertically between the legs. In other cases the difficulty is still greater, and the urine merely escapes drop by drop, whilst the quantity expelled will not be more than three or four ounces, although the patient may be occupied for ten minutes or more in the discharge. The patient experiences a constant desire to urine, and is always pressed by an imperious want, which his attempts to relieve are futile.

Indeed, there can scarcely be any thing more painful, or laborious, than the expulsion of urine under these circumstances: the efforts to which the patient resorts are such that the legs tremble, the face changes colour, perspiration starts out upon the forehead, and frequently faecal matter escapes at the same time with the urine—a circumstance that obliges the patient to make the attempt only in the position of going to stool.

In some cases, the urine, having filled and distended the cavities in which it is retained,

escapes in a continued and involuntary manner, assuming the appearance of incontinence. This last affection, however, can only exist when the stricture is considerable, producing at the same time retention and incontinence. This symptom of incontinence occurs in the following manner:—the urine passes with great difficulty through the stricture, and its discharge requires an energetic contraction of the bladder and abdominal muscles: when these cease to act, that portion of the urethra which is situated between the stricture and the bladder contains a certain quantity of urine, which, being more elevated than the orifice of the stricture, passes drop by drop, impelled simply by its own gravity.

Another species of incontinence is occasioned by a different mechanism, and only occurs when the expulsion of the urine becomes extremely difficult. The bladder being then inordinately distended, the sphincter is overpowered, and the urine, no longer confined by the neck of the bladder, distends that part of the urethra which is posterior to the stricture; and at this time the stricture, and not the neck of the bladder, bounds the fluid contained in that organ. In this state of things, when the patient coughs, walks fast, or employs any effort, the bladder is pressed by the contraction of the abdominal muscles, and the urine escapes in very small quantities through the stricture.

The urethra, being continually irritated by the weight of the urine, pushed with force against the stricture, is rarely exempt from inflammation. However slight may be the inflammation, it produces an afflux of fluids into the vessels of the part affected, occasioning tumefaction, and necessarily augmenting the contraction, so as frequently to prevent entirely the passage of urine.

Inflammation of the urethra, like that of other mucous surfaces, is, in certain states, accompanied by a secretion of thick viscid matter, which accumulates at the inflamed point, and often forms a kind of plug, that presents a further obstacle to the excretion of urine. This may easily be confirmed by introducing, in such a case, a sound as far as the obstacle, which will, when withdrawn, be found smeared at the point with thick matter. This secretion occasionally acquires considerable consistency. Racine mentions a case of ischury in which he introduced a bougie into the urethra: it was arrested at the distance of five inches from the orifice; the patient made violent efforts to urinate, and the obstacle was ejected. It proved to be two lines and a half in diameter, consistent in its character, and was compared by him to a piece of maccaroni.

The sufferings of a patient labouring under advanced stricture are extreme, and the danger

which menaces him is imminent. The desire to urine is felt at each instant, and is accompanied by the most acute pain; the bladder, hard as a stone, is frequently elevated to the umbilicus, the abdomen is tender and painful on pressure, the skin is burning, the pulse is hard and accelerated, the face red and animated; the patient is in continual agitation, and delirium is soon manifested. If the passage of urine be not promptly established by the efforts of nature or the assistance of art, the patient is placed in extreme danger; the urine accumulates more and more behind the obstacle in the urethra, in the bladder, in the ureters, and even in the kidneys. These parts, doubly irritated by distension and by the presence of an irritating fluid, inflame; and the inflammation is sometimes propagated to the peritoneum, and produces the most intense peritonitis. Coition always augments the difficulty of urining, because it cannot be accomplished without the production of irritation, frequently considerable enough to occasion inflammation. It is to this cause that we may attribute the more or less considerable discharge which is experienced after coition by those who have stricture of the urethra: this discharge differs much from that of gonorrhœa, is manifested almost immediately after connection, and is accompanied by little inflammation or pain. Having acquired, in twenty-four hours,

or perhaps less, its highest degree of intensity, it remains stationary during two or three days, then diminishes, and, in four or five days more, disappears.

Such are all, or at least the most remarkable, symptoms of stricture of the urethra ; and their presence constitutes the diagnostic signs of this disease. When a patient urinates with difficulty, and by a more or less delicate jet, when he passes but little at a time, and that often, when he experiences, habitually or at intervals, weight in the perineum, itching in the canal of the urethra, an urethral discharge, and irregular accessions of fever, we may conclude, with tolerable certainty, that he is affected with stricture of the urethra—a conclusion which, if correct, will be at once confirmed by the introduction of a bougie into the canal.

Retention of urine is always a secondary affection, either the consequence or symptom of other diseases, and never constitutes primitive or essential disease : but it must be recollected that it is a symptom which, from its frequency, its gravity, and the particular indications which it presents, demands an especial and well-directed study. In a state of health, the urine is expelled principally by the contraction of the abdominal muscles and bladder. The quantity of fluid which that organ ordinarily contains, without inconvenience, is from a pint to a pint and a half ; but it may

be distended so as to contain from two or three to five or six pints. That distension, if long continued, is often succeeded by a paralysis of the muscular fibres of the organ; and, the contractile power of the bladder having ceased, the patient is unable to discharge his urine: the secretion of urine still continues, and is carried into the bladder, whilst from that organ (incapable of further distension) an equal quantity of urine is displaced and discharged into the urethra. This discharge of the urine, which passes from the urethra drop by drop only, has in many instances misled practitioners, who have considered the patient as suffering from incontinence, and believed the bladder to be empty. It must, therefore, in all such cases be a measure of prudence to introduce the catheter, in order to determine at once the state of of the bladder.

Previous to complete retention, and while the urethra is still pervious, the urine escapes by a very slender jet, which may be supposed to relieve this state of distension; for it might be conjectured that the patient could as completely empty his bladder in urining by a small jet as a larger one. If this conjecture were correct, the patient would pass at a time as much urine as in a state of health, and would not be annoyed, as is the case, by a frequent renewal of the desire to urine. "I have," says Ducamp,

“frequently reflected on this circumstance, and have asked myself, how is it that in strictures of inconsiderable magnitude the bladder is not emptied of more than about a quarter of its contents? Where is the cause of this effect? Is it in the canal which gives passage to the liquid? Is it in the liquid itself? or is it in the sac which contains and expels it? It is not in the canal; for, as this gives passage to a quarter of the fluid, it would, if time were allowed, give issue to the three remaining quarters. It is not in the fluid; for that which is evacuated is precisely the same with that which is retained. The cause is, then, in the reservoir which contains the fluid, and through the agency of which it is expelled.” Desiring to ascertain the nature of this cause, Ducamp submitted himself to experiments, which placed him, as far as regarded excretion of urine, in a situation similar to that wherein persons are found who are affected with stricture. Having a strong desire to urinate, he pressed the penis at the point near the gland, so as to allow of the escape of a very small jet only; much pain was soon experienced in the canal, the desire to urinate became stronger, and the efforts of expulsion more vigorous: he now experienced a violent gnawing pain in the region of the bladder, in the groins, and in the canal of the urethra, which became so acute that he involuntarily

desisted from grasping the penis, and allowed the urine to escape in a full jet. He afterwards commenced the experiment with renewed resolution; similar pains were felt, and they became so violent that he experienced a sensation akin to that which might be produced by the rupture of the canal. At short intervals these pains became more vivid, but at last gradually diminished; and he ceased to urinate before he had evacuated half the quantity that he ordinarily passed at a time, and a considerable pain was still experienced in the urethra. Some moments afterwards, wishing to discover if he had completely emptied his bladder, he attempted to urinate, and passed almost as much as he had done during the experiment. I have performed the experiment of Ducamp, and always with a similar result. I have, therefore, concluded that contractions of the bladder are of short duration—that, in cases of stricture, the expulsion of urine is not complete, because the time which is necessary for the evacuation much exceeds that during which the bladder can maintain its contraction. Alternate contraction and relaxation is a law to which all muscular fibre is subject.

The constant state of distension, to which in cases of complete retention the bladder is subjected, produces an irritation which that organ is unable to support for a long period,

without serious inconvenience. Unceasingly distended and irritated by the urine, rendered more and more acrid and corrosive, the bladder becomes irritable and inflamed, the presence of the fluid is more and more distressing, the efforts to expel it more frequent and energetic, and the danger of the patient's situation more imminent. Occasionally, ulceration takes place, the parietes are perforated, and the urine which then escapes either makes its way through the surrounding cellular tissue, or into the cavity of the abdomen, or into the perineum, scrotum, or penis, producing inflammation, suppuration, or gangrene.

CHAPTER II.

HISTORY OF THE TREATMENT OF STRICTURE ;
 REVIEW OF THE VARIOUS REMEDIES—DILA-
 TATION (BOUGIES AND SOUNDS).

I HAVE thought it necessary to insist more than is generally done in surgical works on the causes of stricture, and on the symptoms by which we may establish the existence of the disease.

Strictures of the urethra, whatever may be their nature, and whatever may have been their duration, constitute a class of diseases of a very serious character, varying in importance according to their seat, their nature, their number, their extent, and their duration, and influenced by the age and constitution of the patient. If they are situated profoundly, if they are numerous or of long duration, if they are considerable in extent or in thickness, the difficulty of cure will be increased.

The treatment of stricture reposes upon bases which I shall now indicate. To dilate

the strictured canal, to prevent its ulterior contraction, to destroy the material causes by which it is produced; such are the indications. An eccentric compression, by means of certain instruments, may accomplish the first object; this is termed the method by dilatation: it is not infallible, for we only compress or remove the indurated tissues which have approached each other, and they rapidly reassume their former position when this means is suspended; yet, in some cases which we shall point out, it is successful. Partial destruction of the altered tissues, or complete destruction of the morbid productions by which they are covered, forms the second indication; and it is by means of cauterization that it is ordinarily accomplished. Incision is sometimes necessary, and we shall endeavour to point out the cases where it is applicable.

At an early period of the complaint, the introduction of a bougie is accomplished with ease, and the cure is rarely difficult; and I need hardly, then, impress upon the practitioner the great importance of removing the affection before it has experienced many complications, or made much progress. Unfortunately, however, the patient seldom appreciates the importance of the disease, and very frequently conceals his situation until the complaint has assumed a formidable character. In

aged persons the fibre is rigid and little susceptible of dilatation—a character which, under favourable circumstances, renders the treatment difficult, and the cure prolonged, if not impossible. In old age, too, the stricture is most generally deep seated, and as the prostate then becomes engorged and indurated, if the stricture be situated in that region, it no longer permits the urethra to assume its natural capacity. It is also in subjects advanced in years that we most frequently observe relapses. At that period of life the patient is subject to catarrh of the bladder, the scrotum is easily infiltrated, the contact of urine with the skin frequently occasions inflammation, and, at last, if a urinary abscess supervene, death is almost inevitable.

I have shewn that strictures are a consequence of a previous inflammation in the canal of the urethra; and, as inflammation of this canal was rarely treated of until the introduction of syphilis into Europe, we can expect to derive but little information on the subject from the works of the ancients. Claudius Galen,* indeed, (whose brilliant genius, vast erudition, and rare talents, rendered him the most distinguished man of the age in which he lived), speaks of carnosities in the canal rendering the excretion of urine difficult, and occasionally requiring the use of

* Galen de Compos. Medic. Sec. loca, lib. iii.

the sound for their removal; but it was not until after the Neapolitan campaign that inflammation of the urethra excited the attention of medical men in general.

Nothing is more instructive in the history of human knowledge than to look back at the origin of those discoveries to which man has been conducted by chance or by reflection. But we are frequently obliged to renounce this attractive occupation, either because the name of the inventor is lost in the night of time, or that we do not discover the indices of a great number of useful arts until an epoch when these arts had already been brought to a certain degree of perfection.

It was about the middle of the sixteenth century, and more especially in Spain, that the attention of the public was so much excited and directed to those diseases of the urethra which interfere with the excretion of urine. These affections were then supposed to be scirrhus of the prostate and caruncula in the urethra: and for the purpose of removing these diseases, bougies were said to have been invented by Philippus, a surgeon of Lisbon, who travelled through a large portion of Europe for the purpose of enriching himself by the sale of his instruments. Francesco Diaz*, a professor at

* Diaz, Tratado, etc. Madrid, 1588.

Alcala de Henarez, states distinctly that Philippus was the inventor. This assertion is contradicted by Amatus of Portugal*, who states that he was well acquainted with Philippus, and that he (Amatus) had taught him the use of bougies in 1541, at the time when the Emperor declared war against Tunis. He names three Portuguese who could testify to the truth of that which he advanced : he adds that they were invented by his master, Aldareto, professor at Salamanca. This statement appears more probable than the former ; and, if true, to Amatus belongs at least the merit of having introduced them to practice. But Andrea Laguna, of Segovia, an accomplished practitioner of his time, who had made many observations during the Spanish war in Flanders and other countries†, was one of the earliest writers on these diseases and their new remedy‡. Portal is deceived in supposing that his work appeared in 1535. The book of Alphonso Ferri on the same subject was not known before 1551§. This last author attributes the engorgement of the prostate to the metastasis of mucosities, to suppuration, and

* Amat. Lusit. cent. iv. cur. 19, p. 337.

† Portal, vol. i, p. 327.

‡ Andr. Lacunæ, Method. Cognosc. et extirpandi excrescentes in vesicæ collo carunculas, in 12. Romæ 1551.

§ Ferrus, de Carunculâ ; in Uffenbach Thesaur. Chirurg.

to gonorrhœa. He employed, first, emollient injections, then bougies impregnated with verdigris, arsenic, and quick lime. Christopher de Vega* followed, to a great extent, the method of Ferrus. Diaz recommended the use of caustics with too little circumspection; he also requires the uninterrupted use of bougies, or we shall have new excrescences, and proposes that, where the bougies then in use do not succeed, to have recourse to those of lead, or to long triangular needles, for the purpose of destroying the carnosities†. Fabricius speaks of bougies made of horn, which were more supple than those then in use, which were metallic; but they were found too rugged, and constructed with difficulty. Tolet says that he saw a catheter made of horn, which had been brought from Marseilles. Before these instruments were used, it was found necessary to dip them in hot water for the purpose of softening them. To these succeeded a more flexible kind, made of silver wire turned spirally. The revolutions of the wire were so entirely in contact the one with the other, that they almost appeared continuous. Tolet saw these sounds at Paris in 1680; but he was not aware to whom attached the merit of the invention. Next

* Vega, de Curatione Caruncularum. Salandat, 1552.

† Amat. Lusit. loc. cit.

came Joannes Grallus, who met with so much success in the treatment of stricture as to stimulate Charles the Ninth to purchase his secret; but it was rarely useful out of the hands of Joannes, and he was accused of having withheld the true secret.

In the case of Henry the Fourth of France, who was supposed to have a caruncle in the urethra, the remedy of Joannes failed, and Henry had recourse to Mayerne, who employed the method of Diaz and De Vega, which was that of opening a passage through the obstacle with a sharp stiletto or needle, and removing it by the consecutive employment of bougies. This was in 1603; so that cutting instruments were employed in the treatment of stricture at a very early period. In December of the same year, a censure of the Faculty of Medicine at Paris declared Mayerne (in consequence of this innovation) unworthy to exercise the practice of medicine, "*propter temeritatem, impudentiam et ignorantiam.*" Henry had a relapse, and was treated by Loyseau, who employed bougies prepared with a composition in which powdered savine was the principal ingredient, and which caused much pain and fever.

Here, then, we find escharotic bougies in use; and they continued to be the ordinary means employed in the treatment of stricture during a very long period. Those two methods

of treatment, incision and caustic, have been brought down through a long series of years to our own times, and they still hold (ameliorated, it is true) an important place in the treatment of stricture.

In later times, these rude caustics were superseded by John Hunter, who, in the treatment of stricture, displayed firmness supposed at that time to amount to temerity ;—and his success is stated to have been very great. Convinced, by frequent dissections, that almost all retentions of urine, of which the cause resides in the urethra, depend on strictures or callosities of the canal, and having maturely reflected and determined on the necessity of DESTROYING the obstacle, he introduced into the urethra, on the extremity of a stiletto enclosed in a canula, a piece of lunar caustic, which was placed in contact with the stricture, and suffered to remain there a more or less extended period. This substance, which burnt and destroyed all that it touched, enabled him to pass through every obstacle.

At that period the occurrence of stricture was very frequent in England ; and this may, I think, be fairly attributed to the early and indiscriminate application of powerful astringent injections, then much used for the cure of urethral discharges. Since that period the disease has been less frequent in this country—occa-

sioned, I should say, by the introduction of a more rational method of treatment in urethritis.

Home, who succeeded Hunter, (and indeed Hunter himself during a later period of his life) introduced into the urethra, as far as the obstacle, a bougie having at the point a piece of nitrate of silver, upon which the bougie was moulded. This was termed the "armed bougie." The bougie having been previously warmed, the caustic was retained there by the contraction resulting from the cooling of the wax. We discover here little improvement on the practice of the ancients, except in the composition of the caustic; and it is easy to perceive that the patient was exposed to much danger by this mode of treatment. If, from the softening of the bougie, the caustic were set at liberty in the canal, it might be impossible to extract it before it produced much mischief.

The different remedies employed for the cure of stricture may be reduced to four—bougies, sounds, caustic, and incision. The ancients, believing that all obstacles formed in the interior of the canal of the urethra and opposed to the free excretion of urine were carnosities, for the purpose of destroying them, resorted to rude caustics, which appear to have been among the first remedies used for the cure of strictures. In times nearer to our own, the study of pathological anatomy has shewn that

those pretended carnosities were generally strictures from induration. Enquiry was then directed to the most effectual means for dilating the canal, and restoring it to its natural dimensions; and for this purpose bougies and sounds were soon resorted to.

BOUGIES.

The bougie introduced into the urethra is, if practicable, passed through the stricture, and permitted to remain for some time in the canal. Being introduced from day to day, the aperture of the stricture is enlarged, and it is found necessary to substitute one of larger calibre in place of the first. This second is introduced, and continued in a similar manner, until it becomes necessary to substitute a third of larger calibre than the second; and so we proceed, gradually enlarging the diameter of the bougie we use, until the jet of urine shews that the canal has been restored to its original capacity.

Whether the obstacle be a simple septum, of more or less extent and thickness, or whether it be formed by an induration projecting into the canal, whether that induration be limited or extended, and whether the obstacle exist in a single point of the canal or in all its circumference, the bougie acts in the same manner:

it removes the parietes of the canal from each other; it flattens the projections; and, by these means, restores to the tube its natural dimensions.

I conceive that bougies have the effect of dilating, of compressing, and of irritating, the canal; and this opinion of their action is in the present day very generally admitted to be the correct one. On referring to the history of these instruments, which I have already given, we find that, at different periods, recourse has been had to different kinds of bougies, calculated, according to the ideas of their inventors, to answer these several objects. The kind most successful in producing the first effect, that of dilating, are those formed of catgut: from their property of rapidly absorbing moisture, they speedily increase the diameter of the tube. If, however, the operation be tedious, those bougies, in consequence of their disposition to absorb moisture, become perfectly flaccid, and consequently incapable of supporting the pressure necessary to overcome the obstacle: they are, however, well adapted to dilate the urethra; and we might, therefore, expect to see them in more general use than they are found to be.

A second kind, which has been used for compressing the canal, was formed of lead; and those bougies were employed from an idea

that the weight of the bougie would powerfully tend to compress the urethra. As these bougies have been for a long time disused, I shall only express my surprise that they could ever have been introduced into practice.

A third kind was composed of some irritating ingredients, and generally produced profuse suppuration, and not unfrequently ulceration. The oblivion into which they have fallen renders it unnecessary further to notice them.

A dilating body, such as the common plaster bougie, if it be proportioned to the size of the canal, must assuredly produce a compression of the parietes. This compression may, to a great extent, it is true, be owing to the reaction of the parietes of the canal upon the dilating body—a reaction frequently so great as to produce in the instrument a permanent constriction.

It has been objected to the treatment by dilatation, that it is impossible, by the use of cylindrical instruments, to restore the diseased portion of the canal to its original diameter, because, as the orifice of the urethra is less considerable than that of any other portion of the canal, we cannot introduce an instrument of sufficient size to dilate the canal so as to give it its original diameter. I do not think this objection is entitled to much weight; for little difficulty would be experienced in incising the

canal at its orifice and rendering its calibre at that point equal to that of any other portion. This operation has been performed by a French surgeon of the name of Despiney, who has resorted to it with the most complete success in those cases where syphilitic ulcers have been situated at the meatus and have produced a contraction of the orifice. In case the incision should be necessary from other causes, I can see no valid objection to the performance of the operation.

Ducamp contended that the frequent return of the disease was mainly attributable to the impossibility (before the construction by him of the bellied bougie) to procure a dilatation equal to the natural state of the canal. I cannot, however, conceive that either enlarging the orifice by incision or introducing the bellied bougie can be of much service; for I have yet to learn why, if there be a disposition in the disease to reappear when a calibre of three lines has been produced in the canal, there should not be a similar disposition when we have succeeded, by the same method, in producing a diameter of four lines; and the only difference will be a more tardy reappearance of the disease in the one case than in the other.

The irritation produced by bougies is partly dependent on the presence of a foreign body,

and partly on the pressure which that body may occasion.

When most exempt from accident, the treatment by bougie is long, occupying three, six, nine, or even twelve months, and requires great precaution on the part of the practitioner and much patience and resignation on the part of the sufferer. During the time occupied in the employment of the bougie, the patient is frequently required to keep the instrument in the urethra through the night, and sometimes day and night; he is obliged to withdraw the bougie whenever he wishes to urinate, and afterwards to reintroduce it; and in many cases he is prohibited from taking the slightest exercise. The necessity of confinement and a repose more or less absolute, is a serious inconvenience, especially if the patient be old, feeble, or irritable; and the presence of the bougie produces frequent interruption to, if not total loss of, sleep. The necessity of removing the bougie to urinate is also in some cases an inconvenience of the highest magnitude, because much difficulty is frequently experienced in the reintroduction of the instrument. The treatment by bougies, too, implies the possibility of passing the instrument through the stricture, which is not always practicable; for, after placing the bougie in contact with the stricture and using gentle pressure, we are un-

able to pass it, either from the orifice of the stricture not being in the axis of the canal, or, if situated in the centre of the canal, being so very narrow, that the bougie is unable to penetrate the obstruction. It frequently occurs that, after having passed through one obstacle, we meet a second, a third, or a fourth, which successively interrupts the introduction of the instrument, and, should it finally obstruct its passage, renders any progress which may have been made ineffectual. After having succeeded in introducing a bougie into the bladder, it not unfrequently happens, when we wish the next day to repeat the introduction, that we find, from the irritation of the previous operation, we are unable to effect our object.

The tendency which bougies have to become softened in the canal, makes them little able to overcome the ordinary obstacles we meet with, and when force is employed, they are sometimes reflected backwards upon themselves; and whilst we suppose, from the length of bougie which has entered the canal, that the passage has been effected and the bladder penetrated, the instrument has not in reality passed the obstruction. This is an occurrence which may happen to a skilful operator. Chopart mentions that, having once believed he had passed a bougie through a stricture, because he had succeeded in introducing a por-

tion of bougie into the canal sufficiently considerable to reach the bladder, he was astonished in a few hours afterwards at seeing both extremities of the bougie at the orifice of the urethra, and then discovered that, when the point of the bougie had come in contact with the stricture and the pressure was still continued, the point was turned backwards, and the means used to urge it forwards had only served to accelerate the retrograde movement it had acquired.

Occasionally, too, the irritability of the urethra is so great that the patient is unable to support a bougie in the canal for five minutes, its pressure being accompanied by excessive rigours, cold sweats, and pain, so violent as often to be succeeded by syncope. The pressing want to urine so frequently felt immediately on the introduction of a bougie, compels its instant removal; and when the irritation produced by the pressure of the bougie is considerable, it is absolutely necessary to suspend its employment, and to subdue, by antiphlogistic treatment, the irritation it has caused.

The instrument should only be left in the canal for a short time; because, if it be allowed to remain in the urethra for a night, as is frequently the case, or even for a much less period of time in that portion of the canal which

is in a healthy state, an irritation or inflammation, attended with more or less of thickening, a greater or less loss of its elasticity, and a disposition to assume the character of stricture, is produced. No one will contend that the application of a heated substance to the surface of the body may not be so momentary as to be unattended with any ill consequence; or that an irritation, as a scratch upon the skin, may not be so transitory and slight as to be unaccompanied by inflammation: but it is equally certain that a heated substance remaining in contact with the skin would produce a burn, and that the continuance of irritation may be succeeded by inflammation. An irritating body may produce an inflammation little marked and possessing a chronic character, or an inflammation more developed, accompanied by suppuration.

The strictured portion of the canal must necessarily possess a less diameter than the other portions, and the common cylindrical bougie must cause more pressure on that portion of the canal than on any other. If such pressure, when considerable, produces suppuration in the contracted portion of the canal, it may, when less considerable, terminate in a thickening of the mucous membrane in the other portion; and a deposition of lymph or serum in the submucous cellular tissue may

occur, and thus tend to the production of a much more aggravated, because more extensive, disease than that for the removal of which the application was employed.

If there be more than one obstacle, and the bougie has dilated and passed the first, it is perhaps found necessary to use a smaller one for the purpose of entering the second; the pressure upon the first stricture having now ceased, it has a tendency to relapse into its former state, and gradually contracts, so that the practitioner will be compelled to recommence in some measure the treatment for each obstruction.

In the greater number of cases the recurrence of the disease is almost a necessary consequence of this mode of treatment: as I maintain that the action of the bougie, except in the early stages of strictures, is limited to dilatation simply; and that, when its use is suspended, the structure, in obedience to a general law regulating all excretory canals, gradually returns to its former pathological condition. In the first stage of stricture, when effusion has taken place into the cells of the mucous and cellular tissues, when the matter is susceptible of absorption,—before the obliteration of the cells of the tissue, and before the diameter of the canal be much diminished,—the effect of a bougie is not simply mechanical, as would be the case in

an inert canal; but, when introduced and retained for some minutes in the canal, morning and evening, may create sufficient irritation to excite absorption and to produce its removal.

It was observed, with much justice, by Bruckmann, that compression is a stimulus which gives more activity to the absorbent vessels; and it is only fair to presume that this excitement is produced in the urethra by bougies; the mouths of the absorbents then remove, by little and little, the tissue which forms the stricture, and cause its disappearance.

The cure by absorption necessarily implies then a capacity for and liberty of action in the absorbents. When, however, the cells of the tissue, either mucous or cellular, become infiltrated, and the infiltration is of so long standing as to have produced decided induration, the tissue no longer possesses absorbents; or, at least, the distension occasioned in the cells of the tissue has obliterated their mouths; and consequently the pressure of any body, however great may be the stimulus it occasions, cannot have the effect of producing absorption. It is true that, if the orifice of the stricture be sufficiently large to admit of the introduction of a small bougie, it may be gradually dilated until it becomes of nearly the

same diameter with the other portion of the canal ; but the reappearance of the disease in a longer or shorter period will probably follow such an enlargement. For a confirmation of this opinion the reader is referred to cases No. 3 and 4, at the end of the book ; and a hundred such might be inserted.

I will here cite the observations of two exclusive advocates of dilatation—men whose opinions are always entitled to the highest consideration—I mean Soemmering and Boyer ; and I believe, after perusing them, every patient would say, if there be any method of cure less painful, less fatiguing, less tedious, by which there is only a probability of the removal of my complaint, I would prefer it. “ To avoid the innumerable disagreeable circumstances which are incidental to this treatment (bougie), it will be wise to assure the patient that the cure will be infallible, and without danger, but long and inconvenient ; that he cannot hope for a radical cure until the expiration of some months ; that all interruption to the use of the bougie will destroy the advantages which may have been previously obtained ; and that a moderate and restricted diet, and entire avoidance of excess of all kinds, must be rigidly observed. It is good to tell him that he ought to accustom himself to introduce bougies ; to recommend him not to intermit their use until he is perfectly

cured; to have always a certain quantity by him—in a word, he ought to be always on his guard to the most minute appearance of a relapse, and immediately to oppose to such a disposition the means in his possession.” Is not this a tacit admission of a conviction in his mind that cures are rarely effected by this means. Boyer, whose vast experience and truly original and powerful mind confer on any opinion of his great weight, says—“The urethra, like the other excretory conduits, preserves, when once it has been contracted, so great a tendency to reproduce the stricture, that we can hardly ever regard the cure as complete. Indeed, every day’s experience proves, that persons who have been subjected to this inconvenience experience a return of the disease. The return of this disease is especially to be feared in men who indulge in excesses of the table; in those who are obliged to make long journeys; and particularly in those who indulge too much in sexual intercourse.” Again he adds—“The cure is rare before the third or fourth month, and often it is much longer. I have noticed that the greater part of the patients cannot renounce the use of the sound under three or four months without experiencing a prompt return of the disease; and, even after the expiration of so long a period, although it may not be necessary that they should persevere in

its use night and day, yet they are obliged to employ it, during the night, for some time." Again he says—"We see patients in whom the urethra is so sensible that they cannot retain the bougie, even during a few minutes, without experiencing much pain; and many days, or even weeks, may occur before they are able to support the instrument for a quarter or half an hour at a time."

If to these observations I add, what I assume has been already proved, that it is in the early stages of the disease only, we can hope (even with all the precautions which have been recommended) to succeed by the use of bougies, the reader will be astonished that dilatation is so generally employed, and will expect the exclusive advocates of that treatment to cling with less pertinacity to their favourite remedy.

SOUNDS.

The treatment by sounds differs so much from that by bougie, though the object in each method is to procure dilatation, that I have deemed it necessary to describe it separately.

The use which is too generally made of the sound is to pass it with force through the obstacles that are met with in the canal, and to penetrate immediately into the bladder. Once introduced, the sound is generally suffered to

remain in the canal for twenty-four hours, when we substitute a catheter of elastic gum of equal calibre : when this catheter becomes free, we pass another of larger diameter, and usually renew them every six or eight days, according to their effects in increasing the size of the urethra, which we ascertain by observing whether the urine passes between the instrument and the canal.

One of the advantages of the treatment by sound, is to give a free course to the urine from the moment of its introduction into the bladder ; and perhaps this advantage is the only one (not possessed by the bougie) which can be urged in its favour ; whilst the inconveniences, which are inseparable from the use of the sound, without being more numerous than those incidental to the treatment by bougie, are at least as serious. It requires a repose still more absolute than the treatment by bougie ; and the pressure of the sound is with more difficulty supported : indeed, individuals cannot always support, for a single day, the pain which they occasion. To pass into the bladder, it is frequently necessary that the sound be urged with considerable force through the obstacles that may be found in the canal. If the obstacle be indurated and extended, and especially if there be more than one, the operation will be diffi-

cult and laborious; the pains which it will occasion severe; and the success of the operation uncertain. In such cases we see persons, possessing great dexterity and long experience, fail in the operation; and it may be easily conceived, that the greater is the force required to pass the obstacle, the less will be the precision which will mark the course of the sound. From the fruitless and repeated attempts to introduce the sound, may arise, as in unsuccessful endeavours to pass the bougie, irritation of the canal and other inconveniences. Accessions of nervous fever are to be feared; and local spasms are often produced in a high degree. As the obstacles sometimes present a great resistance, we are much exposed to the risk of forming false passages, whatever precautions we may take to avoid such accidents. These false passages are formed in two manners: sometimes the parietes of the canal yield before the obstacle is overcome,—and the sound passes out of the canal; at other times, after having passed through the obstacle, the direction of the sound is controlled by the obstacle, and it then escapes from the canal with much facility, especially when it arrives in the vicinity of the neck of the bladder. The false passage produced in the latter situation is the most dangerous, because it is commonly followed by infiltration

of urine. The constant pressure of the sound in the canal frequently occasions inconveniences of a more serious kind than those which are caused by bougies, either because dilatation by the sound is less gradual, or because its presence is more constant. Not unfrequently, the irritation produced in the urethra by a sound is succeeded by ulceration, attended by profuse suppuration. And here it must be recollected, that the advocates of dilatation, while pursuing this plan, are loud in their abuse of caustic, in consequence of its destroying the mucous membrane!

To these inconveniences it is necessary to add an objection, of perhaps more importance, which results from the presence of the sound in the bladder, where it sometimes produces a chronic or acute inflammation of the mucous membrane which lines its interior, and occasions a true catarrh of this organ: this is especially to be feared in old men, or in persons of an irritable temperament. Sounds, like bougies, act as dilating bodies, although they produce a more rapid dilatation of the canal; but even they ought to be continued during, at least, two or three months;—the time dependent, however, on the nature, number, and extent of the obstacles.

I believe the return of the disease is even more frequent, and generally more rapid after

the use of sounds than of bougies, owing, I apprehend, to the less gradual dilatation produced by the former than by the latter method. This, I apprehend, affords evidence of the correctness of the position which I have already laid down, “ that the simple action of dilating bodies, in old indurations, is to remove the parietes to a greater distance from each other ;” and “ that, during the suspension of their use, the adjoining tissues resume their wonted elasticity, and occasion a fresh projection of the induration into the interior of the canal.”

I have now passed in review the methods of treating strictures by bougies and by sounds, and have, I submit, established their inapplicability in the vast majority of cases. I have shewn, that by far the greater number of strictures are an effect of induration existing in the parietes of the canal—that this induration can only be removed by dilating bodies, through the medium of absorption — that, if induration has long existed, absorption can no longer be performed—and that bougies or sounds can therefore succeed in the earlier stages of the disease only ; whilst it is notorious, that application for medical assistance is rarely made until the disease has acquired a formidable character. Absorption being, then, available for the cure of strictures in a very early stage of

the disease only, and compression being, as I apprehend, wholly inefficient for the removal of the obstruction, there remains but one mode by which, in the case of organic stricture, we can restore the canal to its original capacity, and that mode is destruction of the stricture; and this is effected by means of a caustic substance or a cutting instrument.

CHAPTER III.

REMEDIES CONTINUED; CAUSTIC; QUESTION
 CONSIDERED, WHETHER CAUTERIZATION BE
 FOLLOWED BY CONTRACTION, AND WHETHER
 IT SHOULD BE SUCCEDED BY DILATATION.

DESTRUCTION.

DESTRUCTION of stricture implies destruction to a certain extent of the mucous membrane of the urethra; but, if it be shewn that stricture, in the great majority of instances, is the consequence of an inflammation, which has produced a thickening of the mucous membrane alone, partial destruction only of this membrane need occur in restoring the canal to its natural diameter. Even if stricture be produced by a hypertrophy of the submucous cellular tissue, and it be necessary to effect a complete solution of the continuity of the mucous membrane, this need not give rise to any apprehension of danger, if (as I trust has been satisfactorily shewn) a reproduction of this membrane is rapidly effected.

The means that may be resorted to for the destruction of stricture are two, one chemical

and the other mechanical : the one is effected by the application of a caustic substance, which destroys the animal solid to which it is applied ; the other, the removal or eradication of the stricture by incision, effected by means of a cutting instrument introduced into the canal.

CAUTERIZATION.

I approach, with some anxiety, the consideration of the merits or demerits of caustic in the treatment of stricture of the urethra ; feeling, as I do, confident of the advantages which may be derived from the well-directed application of this powerful agent, and yet sufficiently impressed with the obloquy which has been cast upon it in consequence of its abuse.

The success which attended the application of caustic or an escharotic by Loyseau, on the person of Henry the Fourth, did not obtain for that remedy many partisans. Little better success attended its use, even with the modifications successively introduced into the mode of application by Ambroise Paré and Wiseman ; and it was not until Hunter introduced an analogous though modified treatment, that much success attended the remedy :—nitrate of silver was the caustic he employed. That celebrated surgeon, as I have already stated, used for applying the caustic, first, a canula which protected the canal in the passage of the caustic, but, later

in life, substituted for the canula an armed bougie, the use whereof was, after Hunter's death, continued by Home and others.

These methods of applying caustic were evidently defective, and may to some extent account for the want of success which has in this country generally attended cauterization. For who does not in a moment see the dangers which may accompany the use of the "armed bougie." With this instrument a false passage is perhaps more easily made than with any other ; for, acting directly with its point, if this deviate, we may easily and almost unconsciously cauterize any portion of the canal. Indeed, I have been long convinced that the objections to its use were of a very serious kind ; and indeed the objections to every instrument which will not limit the application to the diseased tissue, is almost as great. The armed bougies injure those parts of the urethra anterior to the strictured portions in two ways—first, by the immediate contact of the caustic, which cannot be entirely avoided in their introduction, with whatever rapidity they may be passed ; and next by the urethral mucus dissolving a portion of the caustic, which is thus disseminated over the canal. From these, result not only an inflammation, characterized by a discharge, which is established after the second or third application, and by the scald-

ing sensation experienced during the passage of the urine, but also the formation of eschars of a whitish, membraniform character, which, when detached, leave extended excoriations, which increase the burning sensation caused by the urine, and render the subsequent applications more painful. And this state of things is not unfrequently followed by complete retention of urine. The caustic may escape from the bougie, either because the heat of the canal softens the wax,—relaxing the medium by which it is attached, or because the urethral mucus becomes introduced between the caustic and the wax, dissolving its surface and diminishing its calibre, by which the caustic is placed at liberty in a cavity too large to retain it. The action of the caustic is more decided upon the inferior than superior parietes of the urethra, because that portion dissolved by the mucus always gravitates to that part. Like the method by dilatation, cauterization from before backwards is followed sometimes by a durable cure, but more frequently by relapses. A remedy cannot be useful unless wisely administered; and whilst one mode of application may secure to the patients decided benefit, another may create serious inconvenience, and sometimes produce dangerous consequences. The *modus faciendi* in surgery, as in medicine, is of the highest importance.

The first effect produced by the application of caustic on the mucous membrane in a healthy state, is ordinarily a vivid excitement of the part to which it has been applied, attended by a sensation of heat, more or less intense, according to the nature of the caustic, and prolonged as much more, that the substance employed acts with less energy. The application is often painful when the caustic is powerful; but the pain varies with the character and nature of the tissue to which the caustic is applied. In certain organs, particularly when indurated, the sensibility is so little marked, that the application excites no general nervous irritation, and is described by the patients themselves as simply a smarting of no long continuance, which, after two or three applications, is scarcely perceptible, particularly if the caustic be confined to the diseased structure. Individual cases will certainly occur in which the application of caustic will cause so much pain, general irritability, and inconvenience, that its use must be discontinued. These cases are, however, dependent on peculiar idiosyncracies, and therefore inadmissible in estimating the value of the remedy.

Mucous tissues are little irritable, and enjoy a tonic contractility greater than that of cellular tissue. Their sensibility is obscure and vague in the greatest part of their extent.

Even when inflamed, they are not generally accompanied by severe pain*.

The eschar produced by caustic will have more or less thickness, according to the kind we employ and the time it has been in contact with the substance we wish to destroy : but to produce a profound eschar, it is necessary to use a caustic in the solid state, or one of which the density is so great as to approach very nearly to that state.

Many have been the objections urged against the use of caustic, in consequence of the pain said to be produced by this application : I shall, therefore, be justified in citing the opinions, on this subject, of Messrs. Dumeril and Percy, who were commissioned by the Academie des Sciences, at Paris, to make experiments upon the effects of caustics when applied to mucous surfaces.

They concluded their Report as follows :—
 “ We terminate here with a fact which it is important that we should attest, for it is difficult to believe ; it is, that the action of lunar caustic, in appearance so terrible, and which we thought would have been so painful in the canal of the urethra, is scarcely attended with any suffering, if the diseased surface to which it is applied be affected with chronic inflamma-

* Beclard loc. cit. p. 238.

tion: this is not the case with the potassa fusa, which irritates extremely, and carries its pernicious effects to an extent of which we have acquired fatal proof in the only case in which we employed it." Indeed, the pain caused by the judicious application of caustic is scarcely greater than that produced by the introduction of a bougie; and if the patient is not aware of what we are about, he does not usually detect the difference.

In order to determine the length of time that may occur before the eschar will be thrown off, careful enquiries should be made as to the period the disease has existed. We ordinarily find that the eschar is ejected with the urine from the third to the fifth day, unless the disease be of long standing, in which case it may be retained until the eighth or tenth: this is, however, unusual; and we then find the eschar of a consistence somewhat like horn.

The degree of pain experienced is again dependent on the length of time during which the disease has existed; for if it be of long standing, cauterizations are not painful, and in many instances imperceptible. We know that the indurations of the canal augment with time in density and extent; that their sensibility diminishes as the density increases, and is at last nearly lost; as in the horny tissues to which, by their density, those indurations approach in

character. To judge, however, approximately of the duration of the disease, the epoch should not be calculated from the commencement of the discharge (since that may exist for many years without producing stricture), but from the period at which the patient has begun to experience constraint in the evacuation of urine.

A second application of caustic should not be made until the escape of the eschar formed by the first; for by this means eschar upon eschar is accumulated, and a thick concretion formed, which, when thrown off, obstructs much, and may wholly prevent, the evacuation of urine. This accident occurred to a very eminent surgeon the first time he employed this remedy: the patient did not suffer pain, and he believed he was accelerating the cure by touching the obstacle every day; but at the end of five days a complete retention was produced.

The treatment of organic strictures of the urethra by cauterization is shorter than that by dilatation, less painful, does not expose the patient to so many accidents, and the cure is permanent. Sometimes, it is true, new strictures have been formed in patients who have been cauterized; but their seat was changed. When they have reappeared near the same point, they have been produced by new causes, and may then be considered as altogether different affections to the first. I allude, here, to those stric-

tures from induration which have been sufficiently cauterized; for there can be no doubt that, when the cauterization has been imperfect, a return of the disease may be produced; nor is it probable that a partial cure by caustic is much more durable than that which is obtained by dilatation.

M.M. Deschamps and Percy, in their Report made to the Institute on the work of Ducamp on the Cure of Stricture by Cauterization, say—“It would appear to us to be very difficult to discover a mode of treatment more short, more simple, more certain, more reasonable.” But to obtain these results there are many conditions to be observed: it is necessary to have much circumspection in the choice, to possess much tact in the use, and to direct much attention to the effects of the instruments employed. The great success which has in my hands attended the use of caustic has induced me strongly to advocate its claims to universal adoption.

THE BEST MODE OF CAUTERIZING.

If the application be determined on, it will be necessary to introduce a bougie, in order to explore the canal and determine the exact situation of the obstruction, and afterwards to introduce the bougie, armed with a preparation, for receiving and retaining an impression of the

stricture*, which will serve as a guide in the application of the caustic and enable us to decide to which portion of the canal the remedy should be applied. I believe it will generally be found that this operation, from the pressure necessary to take a cast of the stricture, is the most painful part of the treatment by cauterization. Having, by means of the model bougie, obtained a cast of the obstruction, we should introduce the caustic, and by means of the instrument, a representation and description of which will be found at the end of the work, cauterize the indurated portion of the canal.

In retaining the caustic in contact with the diseased surface, we should be guided by the feelings of the patient; but it should rarely be retained beyond a minute, and it will most probably be found that in that time the whole of the caustic contained in the instrument will have been dissolved: no further application should be made until the eschar produced by the caustic be thrown off. This will generally occur by the third day; but if the caustic be retained in contact with the obstruction for a longer time, or the induration be more dense, and therefore less susceptible, the eschar may not be expelled before the fifth or sixth day.

As soon as the opening has been enlarged by

* See Diagram.

means of the caustic, a bougie should be introduced into the canal and pushed towards the bladder, for the purpose of ascertaining if any other stricture exist. If such be the case, it will be most prudent in the practitioner to cauterize the second stricture at the same time that he makes a second application of caustic to the first, observing the same routine as at the former application. When the eschar has been thrown off from the second stricture, he must again endeavour to explore the canal, for the purpose of discovering if any further obstacle exist; and if this should be found to be the case, he must apply caustic to the three obstacles at the same time. By this plan much time will be saved; as he will be enabled to remove all the strictures in nearly as short a period as would have been occupied in the removal of one, and with scarcely any additional pain to the patient.

Most persons are aware that two different modes have been adopted for the purpose of applying caustic to the stricture: in the first, the caustic is placed in contact with the anterior portion of the stricture, for the purpose of gradually destroying it from before backwards: in the second, the application is made from within outwards. To the former mode there are strong objections—first, the caustic is inevitably applied to the healthy surface, and much inconvenience is by this means occasioned: the pain produced

is violent, and the tumefaction that succeeds to it frequently so considerable as to occasion a complete retention of urine during eight, ten, or twelve hours—an occurrence calculated to produce in the mind of the practitioner much inquietude, and to render it necessary not unfrequently to puncture the bladder. If the symptoms of retention are threatening, or the inflammation very acute, this mode of cauterization should not be had resort to ; for no alleviation in the distress occasioned by the dysury has place until the stricture has been entirely destroyed ; and it is not until that period we are able to determine, with any certainty, whether or not we may be forming a false passage.

The cases in which this mode of applying caustic has been resorted to, by those practitioners who generally apply the caustic to the interior of the stricture, have been those where the orifice of the stricture was so small that it was found impossible to introduce the caustic instrument into the orifice, and they have done so because it was possible that no alarming symptoms might follow the application of caustic to the anterior surface of the canal, and that, if a necessity for puncturing the bladder should occur, the inflammation will, after the performance of the operation, rapidly subside. In these cases, where dysury must always exist, if the

strictured portion of the canal have much extent, four, five, twenty, or more, additional applications must, perhaps, be made before the stricture would be destroyed, and a fortnight or three weeks would necessarily elapse before any relief could be afforded. Next, the irritation produced by the application of the caustic to the healthy mucous membrane (which must always occur in applications made to the anterior surface) is excessive, and frequently obliges the practitioner to lay it aside entirely; whilst the eschar, caused by the application, not being expelled for some days, entire retention may take place; and, lastly, if two or more strictures existed, no relief would be obtained until an entire destruction of both had been effected.

Any method of cauterization, therefore, which does not limit the application of the caustic to the diseased structure, and enable us to restrain the cicatrix, (if it have the disposition to lessen the calibre of the canal) is essentially defective.

The method of cauterization introduced by Ducamp, and modified by Lallemand, undoubtedly limits the application of the caustic to the particular point we wish, and presents so far all the advantage of which the operation would seem susceptible. The operation is performed by introducing the caustic, protected by a ca-

nula, within the stricture, and cauterizing from within outwards.

The introduction of a prepared bougie into the urethra, for the purpose of taking a model of the stricture, secures (if the operator possess only a moderate dexterity) the application of caustic to the diseased surface; and all the symptoms consequent upon destruction or injury of the healthy membrane are avoided. After such precaution, whether the orifice of the stricture be at the centre or side of the canal, great facility and perfect safety are ensured in the introduction of the caustic.

In the next place, after application of the caustic and the escape of the first eschar, a greater freedom is produced in the evacuation of urine, and we are enabled immediately to determine whether or not the instrument has produced any false passage; and also, by the increasing size of the jet of urine, to assure the patient of the success of the application—an object the importance of which must be obvious when we consider the extreme mental prostration which so generally accompanies this affection. Our first object, then, that of limiting the application to the diseased surface only, being, as I believe, attained, our next business is to discuss the question of consecutive contraction.

CONSECUTIVE CONTRACTION.

It has been long supposed that cauterization is inevitably succeeded by a consecutive contraction of the canal; and this is one of the most serious objections which has been made to the operation. The opponents of the system have grounded their principal objection to the operation upon this circumstance; and the force of the objection has been tacitly admitted by the advocates for cauterization. Other remedies have been recommended because they are not, and cauterization has been condemned because it either is, or is supposed to be, necessarily succeeded by contraction of the canal. On the accurate investigation and determination of this question will depend, to a great extent, the opinion we may form of the value of cauterization.

The arguments of the adversaries of the operation rest on a small number of examples of consecutive contraction, and on a supposed analogy which they seek to establish between it and other diseases. They have compared the destruction of stricture by caustic to the ablation of a part of the skin and common integuments, and the cauterized surface of the canal to a wound with loss of substance. It is by no means difficult to shew the inapplicability of this illustration:—to make the cases analogous, they must establish, that wounds of the

skin, with loss of substance, and contused wounds followed by eschars, are similar to those solutions of the continuity of the canal which are consequent upon the application of caustic. But as the majority of strictures is produced by local indurations of the parietes of the canal, we may with more truth compare them to indurations developed immediately beneath or in the substance of the skin. Instead, however, of comparing strictures to any other affection, we shall be more advantageously employed in watching carefully the progress of the disease and the effects of the remedy we employ. If, by affirming the existence of consecutive contraction after the skilful application of caustic, the adversaries of cauterization contend that such contraction ordinarily occurs, their deductions are, I believe, unsupported by experience; and, as far as my observations have yet proceeded, it has not been found that the destruction of stricture by caustic, properly applied, has been succeeded by any disposition in the canal to contract anew. It is true that an extreme case may be occasionally presented; but it would be as absurd to adopt our general treatment for extreme cases as it would be to take the exception for the rule.

In the case of stricture produced by induration, caustic destroys the morbid protuberance, which generally yields easily to its use; and if

we limit its action to the induration which projects into the interior of the canal, and do not destroy the subjacent healthy tissue, the parietes of the canal are preserved, and a healthy surface will be presented. There will be here no granulations produced, since we shall merely remove a morbid tissue; and a thin cicatrix may cover the cauterized surface without consecutive contraction. A similar effect occurs every day in superficial burns, where the fibrous tissue has not been destroyed. After actual loss of substance, unless suppuration be really established, no fibrous tissue is generated, and no consecutive contraction occurs. The analogy on which the adversaries of cauterization have relied is not, then, exact, except in a very few strictures in which an actual loss of the healthy tissue is produced, and is succeeded by a secretion of true pus, and the development of a fibrous cicatrix. But it is stated, as an incontrovertible position, that the canal contracts by little and little after the complete destruction of ordinary strictures, and that these consecutive strictures are even much more difficult to cure than those which have not been cauterized. I am far from wishing to dispute facts asserted by authors of great respectability; but, if we examine those cases which have been sufficiently described, we shall be convinced, from the manner in which the caustic has been

applied, from the pains which have been experienced by the patient, from the (often incredible) number of applications which have been made, that false passages were formed, and that the remedy had acted upon the healthy portion and destroyed the healthy mucous membrane, probably in its entire thickness.

If, when the cauterization have been carefully made, this fear of consecutive stricture has no foundation, what advantages do we expect from the attempt to procure dilatation by means of bougies? The partisans of this treatment have supported its superiority over cauterization on the ground of the contraction of the canal which they say follows cauterization; and have contended for the existence of that contraction upon analogy—an analogy which, I have already shewn, has no foundation.

CONSECUTIVE DILATATION.

I have introduced at the end of this work various cases of persons who had been cauterized and had refused to submit to dilatation; and, although several years have elapsed, they have had no return of the disease. But, if dilatation be not always indispensable, may it not be sometimes useful? or can it do harm? It has been found that patients often, and perhaps generally, suffer as much from the consecutive use of the bougie as from the application of

caustic ; and if the bougie be suffered to remain in the canal for any length of time, as is generally thought necessary, it often produces fever of an intermittent character, which is more or less excited by every successive introduction, and this complication is not at all unfrequent if the canal be very sensible. The irritation produced by the prolonged presence of the bougie, and the consequent tumefaction of the parietes of the canal, increase the difficulty before experienced in the emission of urine, and the stream is seldom permanently augmented by the use of a dilating body. Lallemant says—" when the cauterization has not completely destroyed the obstacle, it is always necessary, sooner or later, to repeat the application, and frequently after much loss of time and suffering. I have had," says he, " frequent occasion to reproach myself for being too timid in the application of caustic, but never for the opposite vice. Among other cases where I have felt this, was that of a judge, in whom, after five or six cauterizations, I introduced, with some difficulty, a sound, number ten. For three months I vainly hoped that dilatation would suffice to re-establish completely the natural dimensions of the canal ; but I was never able to pass a larger sound, and each introduction was succeeded by fever, and great difficulty of urining ; and, when the irritation had passed, the jet re-

mained small and embarrassed. He had often wished that I should take a model of the stricture, for the purpose of again applying the caustic ; but, when I supported the sound against it, the obstacle gave way, the instrument passed, and the cauterization was postponed. At last, after three months of fruitless efforts to dilate the passage, I yielded to the reiterated solicitations of the patient, rather from importunity than conviction of its necessity. I measured with a bougie the distance of the stricture from the meatus, and then applied the caustic. Some days afterwards, the patient was obliged to take a very long journey, and was some time absent ; and when I saw him on his return, he informed me that since the last cauterization he had experienced neither pain nor difficulty in passing his urine."

I am decidedly of opinion, that when stricture has been completely destroyed, either by caustic or incision, the use of bougies has ordinarily a tendency to retard the completion of the cure ; and we always find that patients do not urinate without inconvenience until the use of bougies has been entirely abandoned. I would here, then, distinctly place as a principle (to which I conceive observation and reasoning tend), that dilatation is generally useless as an auxiliary means to cauterization, and may sometimes be injurious. The received opinions

on the subject have been, to a certain extent, founded on prejudice : ideas have been adopted from analogy only ; and, until within the last few years, no accurate observations have been made for the purpose of shewing whether the dilatation, which has hitherto been invariably practised, was necessary or not ;—and in no science does analogy control direct observation. If the observations of Lallemand at Montpellier, Cauvieres at Marseilles, Viguerie at Toulouse, and Gensoul at Lyons, be referred to, it will be found that I have ample support for the opinion I have expressed on the subject of consecutive dilatation. Let it not, however, be understood that I suppose dilatation is hurtful, or even useless, at all times and in all cases ; for in medicine there is perhaps no unvarying rule of treatment :—but to state where it should be used as an auxiliary to cauterization will be a difficult task.

In cases of stricture occasionally met with near the orifice of the canal, and which are produced by adhesions supervening to ulcerations, it is necessary, when we have effected their destruction by cauterization, to prevent the reunion of the parietes, and dilatation may then be resorted to. In cases where there has been a destruction of the healthy tissue, accompanied by suppuration, produced by the application of caustic or otherwise, it may be

necessary to resort to the use of a bougie, not for the purpose of acting as a dilating body, but merely (the morbid structure being destroyed) to restrain the new tissue within the necessary limits, to keep it upon the same level as the other part of the canal, and to obtain a thin, supple, elastic cicatrix. The pain which will be experienced by the patient whenever the caustic acts upon the healthy tissue, will apprise us of the existence of that injury after cauterization.

The patient should observe carefully the jet of urine; and, if he remark any diminution in the stream, or any embarrassment in the canal, which cannot fairly be attributed to accidental irritation, should at once introduce a bougie for the purpose of ascertaining the state of the canal. It will, however, be essential not to apply a strange body to the parietes of the canal too soon; for if the inflammation, consequent upon the application of the caustic, have not wholly subsided, it will, in all probability, be aggravated by the presence of a foreign body. But if no such effects as I have alluded to have been produced, and complete destruction of the stricture have been effected, no such treatment is required; whilst, however small may be the quantity of indurated matter we permit to remain, we cannot hope to remove the obstruction by dilatation; for the canal will

then be absolutely incapable of extension by absorption.

As the great majority of strictures are the effects of induration of the tissues, which has generally existed for a considerable time before application is made to the practitioner—who is seldom indeed consulted until the stream of urine is so inconsiderable as to occasion much inconvenience to the patient—and as it has been shewn that dilatation has then ceased to be effective for the removal of the disease—either caustic or cutting must be resorted to. Much of the obloquy that has been heaped upon cauterization has unquestionably been occasioned less by the action of the caustic than by the unskilful mode in which it has been applied; and it is certain that, from the improvement in the instruments by which the application is made, no apprehension need, in the present day, be entertained that the caustic will come in contact with the healthy tissue. I have always felt the strong objections which present themselves to the application of caustic to the anterior surface of a stricture, as well as the very serious accidents to which such application may give rise. It has, therefore, been for some time an object of anxiety with me to render the treatment by caustic free from these objections, by devising some means of penetrating the stricture, however small may be its

orifice, and effecting its destruction from within outward; and I now submit the following modifications of treatment in such cases.

Should the orifice of the stricture be too small to admit of the introduction into it of an instrument bearing the caustic, it may be immediately enlarged sufficiently, by the introduction of a cutting instrument, which will be found described and represented at the end of the work. Immediately after withdrawing this instrument, which will sufficiently enlarge the orifice, the instrument bearing the caustic should be introduced, and the application made to the interior of the stricture. With these modifications, a case of stricture from advanced induration can scarcely, I think, occur, in which the use of caustic may not be resorted to with the most perfect safety and the most certain success. Even when the orifice of the stricture is so small as to admit of the evacuation of urine only drop by drop, it may be instantly enlarged, the caustic applied, and all apprehension of retention immediately removed. Taking, then, into consideration all the circumstances connected with cauterization, firmly impressed as I am of the necessity of entirely destroying the induration, convinced too, from experience, of the perfect safety with which caustic may be applied, and the facility with which, under the modification I

propose, it may be placed in contact with the interior of every stricture—feeling that this is the desideratum which has been long sought for, and that nothing now appears wanting to ensure the success of the application—I earnestly recommend its adoption by the profession, asking from the operator nothing but the precautions which I have recommended. I here terminate the remarks I have to make on cauterization, and shall proceed to describe the treatment by incision.

CHAPTER V.

REMEDIES CONTINUED ; INCISION.

THE use of cutting instruments in the treatment of stricture is not, at all events, subject to the objections which are frequently made by prejudiced minds to any thing like innovation or novelty: this treatment was conceived and employed three centuries ago by De Vega and Diaz; and at the commencement of the seventeenth century by Mayerne, in France. After that period, however, it was little used, and became almost unknown for a long period of time, until within the last few years, when an attempt was made, without much success, to revive the treatment. The revived operation appears to possess no advantages over that of Mayerne, and, except in skilful hands, would present more formidable difficulties. By the instruments which have been hitherto used for the purpose, the operator has had the power of incising the stricture at one or more points only, and thereby facilitating the introduction of a bougie or catheter, while the indurated portion still remains attached to the sides of the canal.

The danger of unsheathing in the urethra a sharp pointed instrument is so considerable that few men can perform the operation successfully. Practice and manual dexterity may, it is true, enable their possessor to overcome difficulties insurmountable to ordinary men. Laennec, by great application, had acquired so much dexterity in auscultation that he was rarely in error in determining the character of diseases of the chest; but I question whether any other man, however much he may have applied himself to the task, and however varied may have been his opportunities, ever acquired so perfect an acquaintance with the art as was possessed by that lamented individual.

I entertain apprehensions, founded upon the opportunities of observation which have been afforded me, that, in the hands of individuals little accustomed to the use of the instrument lately recommended for the purpose of destroying stricture, much mischief might be produced.

Doerner, some years since, introduced, for the purpose, an instrument which presented a lancet protected by a catheter. The operation once succeeded in the hands of a very expert operator, Viguerié of Toulouse; but I have no hesitation in counselling the rejection of the instrument, since no guide is afforded us in its use: we effect perforation of the ure-

thra, or incision of the stricture by chance ; and we can only be surprised that success has ever attended the method. It has all the vices of forced catheterism with a pointed sound. With regard to Mr. Stafford's instrument, the principle of which is so similar to that of Doerner, I think precisely the same objections apply to it as to the former.

Still, as far as the principle of removing stricture by incision is concerned, I am an advocate for the measure under certain circumstances.

In those cases where the stricture is of a valvular kind, where it retreats before the bougie, and where, from this circumstance and its trifling extent, some uncertainty would attend any attempt to cauterize it, the cutting instrument I have invented may be employed with the most complete success. Where the induration has become so excessive that the indurated matter acquires almost a horny texture, and where the extent of surface which it occupies is inconsiderable, and, lastly, when any circumstance renders it necessary that the stricture should be very rapidly destroyed, in all these cases I do not hesitate in recommending the employment of this instrument. By the operation which I have introduced, the obstacle is instantly removed, after which an elastic catheter is passed into the bladder, for

the purpose of protecting the incised portion of the canal from the irritation which would be produced, by the escape of the urine, during the evacuation of the contents of the bladder. The instrument which I have constructed for the purpose is described in the Appendix, where a representation thereof is given. It presents a circular cutting edge, is introduced into the urethra in a canula, and when the canula is in contact with the stricture, a probe or stilet, situated in the centre of the cutting portion, is gently introduced into the orifice of the stricture, and serves to maintain the instrument in the proper position in the canal. The cutting instrument is then advanced, placed in contact with and pressed against the stricture, a circular motion being at the same time given to it, similar to that given to a trephine, and in two or three moments the stricture is removed and the canal free. The operation may be performed with much facility, is wholly unattended by danger, and the pain is not much more considerable than that which accompanies the application of caustic.

It possesses then, in the cases I have mentioned, the following advantages over caustic:— that of being more completely under the control of the operator, of creating less inconvenience than is occasioned by cauterization (a single operation being, under any circumstances,

sufficient for the removal of the disease), and of being applicable in cases when caustic, either from excessive induration, nervous irritability, or other circumstances, cannot be so advantageously applied. But to ensure these advantages, I cannot conceal from myself the conviction that much dexterity and long experience in the use of the instrument are necessary.

The instrument is adapted to ascertain, first, the situation and extent of the stricture, next to retain it in the position most favourable for removing the obstruction, and finally to grasp firmly the strictured portion until severed from the surrounding tissue; and a single introduction of the instrument is all that is required to effect these objects. The operation of incision has been repeatedly performed by me with this instrument, with the most complete success, the obstruction having been removed in a single operation; and I entertain, therefore, a strong conviction that it will be found a valuable remedy in the treatment of those cases of stricture of the urethra which I have described, in which caustic and dilatation are inapplicable, and will contribute to the alleviation of those sufferings consequent upon obstinate strictures.

There is one more circumstance connected with cauterization and incision to which I shall allude; and that is the apprehension entertained

by many persons of the occurrence of hemorrhage, which they think likely to succeed the judicious application of either of these remedies. No hemorrhage which is likely to succeed the skilful application of either of these remedies need occasion any disquietude except in cases of extreme debility : for, before the blood vessels enter the mucous system, they become capillary. If, however, hemorrhage should prove troublesome, cold water may be dashed upon the penis and surrounding parts, or injected into the urethra, and one or other of those applications will generally be found effectual to arrest the discharge. If, however, the hemorrhage have proceeded to such an extent as justly to inspire inquietude, if the means I have already recommended should have failed, it may be necessary to resort to pressure; and for this purpose we introduce into the canal of the urethra the largest size bougie which can be admitted; and if this should be insufficient, it should be accompanied by external pressure along the penis and perineum.

CHAPTER VI.

CLASSIFICATION OF CURES ; PRINCIPLES ; AND
GENERAL REMARKS.

HAVING treated in succession of the anatomy and pathology of the urethra, the diseases to which that organ is subject, the changes produced by those diseases in its structure and condition, the effects produced by these changes on other organs, and the remedies best calculated to effect their removal, I will terminate this portion of my labours by a few general remarks on obstructions of the urethra.

It is by classifying our experience and our observations that we can alone promote scientific acquirement. It is only thus we can safely use particular cases to establish general rules.

Whether the superstructure which we have built upon the observations made and recorded be stable, whether the general rules laid down be justified by the observations which are recorded or not—of one circumstance there can be no doubt, that observations judiciously and honestly made possess great value ; for they enable others, first, to estimate the value of

one's own deductions, and, if they should be found incorrect, they may constitute a foundation for other principles which shall not possess the same elements of decay.

To the disgrace of the medical profession, no classification of the symptoms, no observation of the complications, no comparative estimate of the success of certain modes of treatment of disease, was formerly made. The importance of those subjects is now, however, fully admitted, and the laws of induction are rapidly attaining supremacy.

These observations were made in one hundred and nineteen cases of stricture.

Of these one hundred and seventeen had suffered from urethral discharges.

In 49, astringent injections had been used.

5 had been subjected to forced catheterism.

29 had, during the progress of the disease, complete retention of urine.

6, retention of spermatic fluid.

6, catarrh of the bladder.

7, paralysis of the bladder.

13, urinary fistula.

6, urinary abscess without fistulous communication with the urethra.

4, spasmodic affection of the urethra, without organic affection.

4, urethral hemorrhage, previous to and during treatment.

14, tumefaction of the prostate.

5, tumefaction of the testicle.

8, diseases of the skin.

This is then a fair estimate of the frequency with which individual complications occur. Of the hundred and nineteen cases,

36 were treated by dilatation, of whom

11 only were cured by that means, and of the remainder

19 were afterwards cauterized successfully.

81 were cauterized primarily; of these

72 were successfully treated by this means.

Of the 72 who were successfully cauterized,

13 had relapses.

Of the 72 who were cauterized,

65 were treated by consecutive dilatation.

Of these, 13 had relapses.

In 7, consecutive dilatation was not employed, and no relapse occurred.

5 cases were incised by the urethrotome.

4 of them successfully, the obstruction being at once removed: in the other the operation was not completed.

In seven cases of cauterization, when the cure was permanent, and in the four cases by incision, consecutive dilatation was not employed.

Of the thirty-six cases treated by dilatation,

4 were in persons above 60,

20, in persons between 40 and 60,

8, in persons between 25 and 35,

4, in persons under 25.

Of those above 60, 2 failed; amelioration only having been produced.

Of those between 40 and 60, 4 were cured and 16 failed; the reappearance of the disease soon following the suspension of the treatment.

Of those between 25 and 35, 3 were cured and 5 failed, the disease soon reappearing.

Of those under 25, all were cured.

In those nine cases where cauterization failed, the parties were of the following ages: 42, 45, 58, 60, 76, 63, 69, 76, 77.

The patients of sixty-nine and seventy-seven died of cerebral affection during the treatment; the patient of seventy-six became impatient and was lost sight of; the four younger patients, in consequence of a relapse, refused to undergo further treatment: of the other two I can give no account.

In the 72 cases where cauterization was successful,

8 were above the age of 60;

of these were relapses 3.

24 were between 45 and 60;

of these were relapses 6.

22 were between 35 and 45;

of these were relapses 3.

18 were between 20 and 30;

of these was relapse 1.

In the five cases of incision—

4 were between 45 and 60 ;

these were all cured.

1 between 40 and 45, not cured.

The cases then, during the progress of which total retention occurs, are in the proportion of one in four. Those in which perineal abscess occurs are as one in six. Those in which fistulæ occur are as one in nine. Those in which spasmodic strictures, in the absence of organic disease, occur, are as one in thirty. Those in which urethral hemorrhage occurs in a similar proportion. The cures by dilatation are as one in three. The cures by cauterization are as fourteen or fifteen in sixteen. I am not in a condition to state the proportion of relapses after dilatation: those after cauterization are as one in seven or eight; and the age which afforded the greater proportion of relapses was above sixty. Of the cases of stricture which are presented, the proportion occurring at given periods of life is as follows :

From sixty to seventy, one in twelve.

— fifty to sixty, two in eleven.

— forty to fifty, three in eleven.

— thirty to forty, four in thirteen.

— twenty to thirty, one in seven.

I have shewn, I trust, to the satisfaction of every reader, that stricture of the urethra is a

consequence of inflammation possessing either an acute or chronic character, which has affected, and still may continue to affect, either the mucous membrane by which the urethra is invested, the subjacent cellular tissue, or both simultaneously:—that a discharge of a mucous or muco-purulent fluid accompanies inflammation of the mucous membrane of the urethra:—that a tolerably complete occlusion of the canal may occur in consequence of the engorgement of the membrane in acute inflammation:—that a complete occlusion can scarcely occur in chronic inflammation of the membrane in the absence of any foreign substance; but that a viscid mucus may attain such a consistency as to act in the manner of a plug, and produce a perfect occlusion:—that, if retention of urine be produced by acute inflammation, it is to an antiphlogistic mode of treatment that we must have recourse; and that, if that fail in procuring relief, we must puncture the bladder:—that when occlusion occurs in chronic inflammation, we may expect to procure relief by forced injections:—that in the earlier periods of organic stricture, before the mouths of the absorbents are blocked up, we may produce a cure by the judicious employment of pressure, effected by means of a bougie:—that, if induration have proceeded to much extent, the absorbents are no longer free to act, and the employment of bougies can produce no per-

manently good effect, and may prove injurious:—that if the induration be considerable, we can only remove the embarrassment it occasions by accomplishing its destruction, either by a caustic substance or a cutting instrument:—that destruction may be effected by the use of caustic:—that, in the application of this remedy, we need entertain no apprehension of injuring any but the indurated portion; and that the pain attendant upon the application of lunar caustic upon the indurated mucous membrane is inconsiderable:—that when entire destruction is effected, we need not resort to consecutive dilatation; and that, if we do, it will be attended by no good effect:—that the application of caustic to the anterior surface of a stricture should always be carefully avoided:—that no case can occur, if we except peculiar idiosyncracies, in which we may not, with the modifications described, apply the caustic to the interior of the stricture—(of course, it must be understood that I by no means deny that an extreme case may occur in which the application of caustic cannot be made, in consequence of some particular circumstance or idiosyncrasy):—that, under the circumstances I have mentioned, the use of the cutting instrument may be attended with the most beneficial results.

In estimating the comparative merits of the remedies in use for the cure of stricture,

whether by dilatation, cauterization, or incision, it cannot fail to be observed that, in this, as in other disputed questions, the exclusive partisans of either remedy are loud and indiscriminate in their abuse of the other. I have no disposition to hide the inconveniences consequent upon either method, nor to deny that, without much care on the part of the patient, and discretion on the part of the practitioner, success is uncertain, and the reappearance of the disease probable.

A patient, who has suffered much from stricture, should recollect that after it has been removed the case is placed almost at his own disposal; excess of every kind should be avoided, the size of the jet of urine occasionally observed, and, if doubt exist, a bougie occasionally introduced, for the purpose of ascertaining the state of the canal. This is a precaution which patients are seldom disposed to observe, but upon which the practitioner must insist; the inconvenience is trifling, the benefits are certain, and a strict attention to these circumstances would effectually secure the patient from a return of the miseries attendant on an advanced state of the disease.

I would also, in conclusion, urgently recommend practitioners, as they value the safety of their patients, or their own peace of mind, sedulously to cultivate an intimate knowledge of

the anatomy of the urethra before they attempt to perform either of the operations for the removal of stricture ; for certainly no operations require for their successful performance a more intimate knowledge of the structure of the passage in health, and the changes produced in it by disease, than those which are performed upon the urethra. It is a duty I owe to the public, to the profession, and to myself, to impress this subject upon their attention; for it is a humiliating reflection, but which is nevertheless most true, that the greater number of complicated cases which are met with have been wholly caused by the unskilful treatment of the persons to whose care they have been entrusted.

CHAPTER VII.

TREATMENT OF CASES OF RETENTION DEPENDENT UPON ACUTELY INFLAMMATORY AND SPASMODIC ACTION.

LITTLE anxiety would be excited with regard to stricture of the urethra, were it not for the facility with which, by excesses of any kind, they may occasion retention of urine; and it is to this occurrence alone that they owe their great importance. There are other circumstances, it is true, connected with stricture, which give rise to much inquietude and misery; I mean the existence of abscess in the perineum and fistulæ—diseases which are most frequently the consequence of an irritation in the canal of the urethra, produced by obstruction in the passage of the urine, and caused by a stricture in the urethra.

Retention of urine may be produced during the existence of two very opposite states of the urethra, chronic and acute inflammation. Chronic inflammation, I believe, never produces of itself an entire occlusion of the canal; but the orifice of the strictured portion may be too minute to admit the smallest bougie, and at this time a perfect occlusion may occur, in

the manner I have already described. The next, and, as I apprehend, the only mode by which a perfect occlusion of the canal is produced in the absence of the plug, is that state of the mucous membrane in which considerable engorgement accompanies acute inflammation. When this affection exists, it frequently occurs that, in consequence of excesses of almost any kind, the engorgement becomes so much increased that the parietes of the canal are placed in absolute contact, and perfect occlusion is produced. Not unfrequently, the disease at this period, even before the occlusion has been produced, is subject to a complication of a serious nature:—the irritation becomes so considerable as to excite a spasmodic contraction of those muscles which are in such intimate relation with the membranous portion of the canal, and complete retention is the consequence. It may, like many other spasmodic diseases, be produced by any thing which can act strongly on the nervous system, and particularly by vivid affections of the mind. Rousseau was affected with frequent retention, to which he had been subject from infancy: he supposed himself to be suffering from stone in the bladder, and Morand made many unsuccessful attempts to introduce the sound: at last, Frère Côme, with much difficulty, succeeded in entering the bladder, and

assured the philosopher that there was no stone. From this period the alarm of the patient subsided, and the embarrassment became less violent. There can be little doubt but that he was affected by a spasmodic contraction of the canal; for, at his death, an examination of the urethra was made, and it was discovered that no organic disease nor foreign body existed in the excretory canals of the urine.

In this species of stricture, it is important to avoid every kind of irritating application, to exhibit an emollient lavement, containig a small quantity of a solution of opium or belladonna, to apply leeches to the perineum in considerable numbers, and, during the application, to place the patient in a warm bath, where (if relief be not sooner obtained) he may remain during three or four hours. This treatment will rarely prove unsuccessful; if, however, it be not attended by an alleviation of the symptoms, and if the signs of retention become more urgent, it may be necessary to introduce, with great care, a bougie into the urethra, and to place it as nearly as possible in contact with the obstacle. These are the cases in which the catgut bougies are likely to be most beneficial. The bougie, placed in immediate contact with the obstruction, rapidly absorbs the moisture found in the canal, and, by increasing in volume, has necessarily a tendency to dilate the stricture. It will

generally be found that, in a very few minutes, a pressing desire to urine will be experienced. The bougie should then be removed, and the urine will ordinarily follow; if, however, these remedies should, in any case, fail to produce a discharge of the urine, we must resort to other means for obtaining relief. The most pressing indication to fill in these cases is to endeavour to empty the bladder, by opening for the urine a passage by its natural canal; or, if we should not succeed in that, to open a new passage. To effect this purpose, various means have been had recourse to:—catheterism, the introduction of a bougie against or within the obstacle, forced injections, forced catheterism, puncture of the bladder or of the urethra. In very many cases, with a little manual dexterity, the patient may be relieved from the retention by the introduction of a catheter; and, with regard to this operation, I shall only add one remark to those I have already made. An error has not unfrequently arisen, in consequence of a belief (which is often produced) that we have penetrated into the bladder. This belief has been produced by the escape, through the catheter, of a small quantity of urine, which has been lodged in that dilated portion of the urethra which is seated immediately behind the stricture. To assure ourselves that the catheter is in the blad-

der, we should move it in all directions: this we cannot do without much pain, if the instrument be still in the urethra.

The mode of relieving retention by forced injections is, I think, only applicable to those cases produced by the formation of a plug in the manner I have already described. This operation, imagined and practised with success by Trye, and afterwards in Germany by Soemering, and in the present day by Amussat, is performed by introducing into the urethra as far as the stricture an elastic, flexible catheter, of small diameter and open at the two extremities; to this is adapted an elastic gum bottle, which has been previously filled with warm water. The tube of the bottle should be almost capillary. The operator with the left hand supports firmly the parietes of the urethra against the catheter, while with the right he compresses the bottle so as to force its contents into the urethra. If the occlusion be produced by the presence of the plug to which I have alluded, it is rarely that it is not removed and immediate relief obtained. It will occasionally occur that a greater quantity of force must be applied: we then place the bottle between the knees, when we may use almost any force which may be required; but this must be done with care, or we may produce, in irritable subjects, febrile excitement, which is, however, easily dissipated

by the application of leeches to the perineum and the use of baths; but is always better avoided.

Forced catheterism and puncture of the bladder are means to which we should not have recourse until all other means of relief have failed. Indeed, the danger and inconvenience arising from forced catheterism are so considerable, that there are few practitioners who have not abandoned the operation, which is really often simply a puncture of the bladder by the urethra—a much more difficult and dangerous operation than when made above the pubis. The objections to forced catheterism are of the most serious kind. We are never sure that we are pushing the sound in the direction of the axis of the urethra; for the curvature varies so much in different subjects, or indeed in the same subject, according to the more or less considerable distension of the bladder. These difficulties augment if there are many strictures one after another; for the lateral pressure which is exercised by these obstacles prevents us from being certain of the direction of the instrument. It is then almost impossible to avoid false passages; and the instrument, sometimes repulsed by a stricture which is more resistant than the surrounding parts, sometimes supported on the sides of the urethra instead of being in contact with the stricture, perforates the parietes of the

canal and passes into the subjacent cellular tissue, near the pubis or rectum, which it often perforates. Where the irritation is excessive, I cannot help thinking forced catheterism is extremely imprudent, and calculated to aggravate all the evils already existing; because we must either allow the catheter to remain in the bladder, and become an increasing source of irritation to the canal, or, by withdrawing it, again subject the canal to all the violence of fresh introductions, repeated whenever the patient may require to urinate. The most frightful accidents have resulted from this mode of treatment, and many patients have died from its effects: this is conceded even by the partisans of the operation. If, however, extreme irritation, or false passage, or indeed any more fatal complication, be not the consequence of the operation, the state of the patient is not ameliorated. The urgency of the symptoms consequent upon retention is, it is true, removed; but the affection of the urethra upon which the retention was dependent is aggravated, as well by the violence to which it was subjected on the introduction of the instrument, as by the irritation produced by its presence in the canal—an irritation generally found to be insupportable, even during a few hours. Such were the motives which induced Deschamps to abandon the practice of forced catheterism; and the proscription

of a method by which so many fell victims to the most frightful accidents, even in the hands of Desault, ought to be equally convincing in the present day, when it is acknowledged that force is powerless to triumph over strictures of the urethra.

If, then, the remedies I have already described be unsuccessful, and the necessity for immediate relief be urgent, I am decidedly of opinion that, in all these cases, puncturing the bladder should be preferred to the risk of the fatal consequences so frequently attendant on a forced catheterism. I know that many surgeons have denied the necessity for puncturing the bladder, and asserted that, with a moderate address in the use of the sound, it will never be required, and that the false routes, which are sometimes unavoidable in the forced introduction of the catheter, are accidents much less formidable and infinitely less serious in their character than the consequences of puncture of the bladder. I know also that a long experience, a study especially directed to the operations which may be performed upon these organs, and an extraordinary manual dexterity, enabled Desault to triumph over all obstacles in the introduction of the catheter; and that the experience of Desault, Chopart, and Deschamps, (for a time) induced them, from this cause, to renounce the operation of puncturing the bladder. The example of these great men has occasioned a belief

that the puncture of the bladder is an unnecessary operation—that the cases which appear to require it are more or less numerous, according to the degree of dexterity possessed by the surgeon; and, finally, that, by maturely studying the nature of the obstacle, the direction of the canal, and its several relations with the adjoining organs, we may always introduce a catheter into the bladder.

From the opinion that it is never impossible to penetrate the bladder by the canal, and that the dangers which may accompany forced catheterism are always of less magnitude than those which are a consequence of puncture, I entirely dissent. I do not mean to assert that a forced introduction of the catheter may not at any time be effected; but I maintain that it is an extremely dangerous operation, even in the hands of an expert operator*. The accomplished Desault, it is true, appears to have failed on only one occasion in the performance of this operation; but it has been acknowledged

* “ Mais la déchirure des parois du canal par l'action de la sonde entraîne quelquefois des effets les plus graves : nous avons vu la fièvre, accompagnée des symptômes nerveux les plus formidables, succéder au cathétérisme forcé, et entraîner la mort dans un espace de temps assez court.” “ Il est fort important que les jeunes praticiens, surtout, soient pénétrés de la susceptibilité de la constitution, en pareil cas, des dangers qu'elle peut attacher aux procédés de restauration du canal, et de la circonspection avec laquelle on doit user du

that many patients were the victims of false passages which he had made; others, less fortunate, had the rectum pierced, and were to the end of their lives affected with urinary fistulæ by the anus.

The more, too, the obstacle is removed from the neck of the bladder, the more dangerous will be the operation: it is seldom, however, that much difficulty is experienced in forcing the instrument into the bladder after we have succeeded in passing the first stricture; because, if more than one exist, the orifice of the first is the smaller. In cases which are dependent on acute inflammation alone, or in combination with spasm, I maintain that, even if no false passages be produced, no method of relief is so pregnant with danger as forced catheterism. If the necessity for the evacuation of the bladder have become so urgent as to render instant relief imperative, every prudent practitioner should prefer puncture of the bladder to forced catheterism, the more especially when we recollect that the inflammation of the urethra will, ordinarily, have so far abated in forty-eight hours, as to allow of the excretion of urine by the natural channel.

cathétérisme forcé. Il faut au moins ne pas l'employer de préférence lorsqu'il est possible d'y reussir par d'autres moyens."—*Delpech, Clinique Chirurgicale.*

APPENDIX.

CASE I.

A MAN of the age of thirty-eight had been affected twice with contagious urethritis. The first discharge had been cured in a few days by the use of copaiba : on the second occasion the same remedy was resorted to ; but, having taken a large dose of that medicine, his stomach became so much disordered that he could not repeat it ; and any other medicines which were exhibited excited so much nausea, that they were necessarily discontinued. He was then recommended to employ astringent injections, which were used for some weeks with various success, but without terminating the discharge. While he was using the injections, he became alarmed at the tenuity of the stream of urine.

It was at this period he applied to me ; upon which I introduced a model bougie, and obtained the cast, No. 1*. As it was evident the disease was recent, I considered this to be a case in which dilatation was applicable, and commenced the use of bougies. The patient

* See Plate.

suffered much distress on account of the difficulty he experienced in evacuating the urine; and, wishing, if possible, to afford him immediate relief, I introduced, the first day, a small catgut bougie, which I suffered to remain in the canal a quarter of an hour, and which I found some difficulty in removing, in consequence of its being much constricted by the stricture, which was of small extent. I then resorted to the use of the common plaster bougie, conceiving that it would occasion as much pressure and irritation as were requisite to procure absorption. I persisted in their use for seven weeks, introducing them morning and evening, and suffering them to remain in the canal only ten minutes at each period. At the expiration of that time he was completely cured, and has not since experienced any return of the disease.

CASE II.

A man of fifty-six years of age, of a strong and hale appearance, had suffered from three urethral discharges, succeeding to suspected connections, none of which had been treated by injection, but each had been succeeded by a tedious discharge. The secretions (the latter of which was peculiarly obstinate) were accompanied by uneasy sensations in the urethra, and frequently by a difficulty in voiding the urine. The irritable state of the urethra had produced

a disposition to urine, which it was necessary to gratify incessantly.

The prepared bougie was at once introduced for the purpose of obtaining a model of the stricture, when the canal was found almost obliterated, the model presenting a mere thread-like termination. Model, No. 2.

A bougie could not be retained in the urethra for a minute without great suffering; so that I immediately, though with some difficulty, made an application of the caustic to the interior of the stricture, revolving the instrument for the space of a minute. On the following day no change had occurred: the succeeding day, still the same; and the patient displayed much annoyance at what he considered a tardy mode of relief. On the third day the eschar was ejected, and the jet of urine was immediately restored nearly to its natural size. I then commenced the use of bougies, which were introduced twelve times; and, in sixteen days, every thing had proceeded so satisfactorily, that the patient said the jet was larger than he had ever recollected it.

CASE III.

A. S. a labouring man, of a nervous and irritable temperament, was affected with complete retention of urine in the latter end of 1830. During the earlier period of his life he

had suffered from eleven or twelve attacks of urethritis, succeeding to suspicious connections. The present attack he supposed to be produced by cold.

I introduced a very small bougie into the urethra, and without much difficulty succeeded in passing it into the bladder; after its removal, the bladder was immediately emptied. I introduced, in the evening of the same day, when the patient was much calmer, a model bougie, and it was arrested at the distance of four inches and three quarters from the orifice of the canal: the contraction, however, was not very great; and, as the disease was apparently recent, I decided on employing dilatation. I passed a bougie, No. 3, which was allowed to remain during half an hour. On the following day I passed one of larger size; but the canal became a little irritated, and I removed it in less than half an hour. On the following day I found all the symptoms aggravated; and, on enquiry, I found that the irritation of the urethra had, contrary to my special injunctions, impelled him to a sexual connection with his wife. I, however, succeeded in introducing a bougie of small size, which I suffered to remain in the canal twenty minutes; but it was succeeded by irritation and swelling of the testicle. It was now necessary to suspend for a time the use of bougies. In two or

three days, on introducing another bougie, I found the canal still irritable ; and I am of opinion that, in defiance of pain, he indulged in the way I have already stated. On withdrawing the bougie, I found it constricted in the point corresponding to the seat of stricture. I, however, persisted in the use of bougies with sensible amelioration, the irritation having become less marked, and the jet of urine having attained nearly its natural size. In about a fortnight the patient appeared recovered, and I dismissed him, merely with a request to introduce a bougie every two or three days. This he did ; but at the end of a month found himself no longer able to do so, the jet having become gradually smaller. When he again applied to me, I introduced a model bougie, which was arrested at the same spot I have already named. Although no violence had attended the operation, I was surprised (after the removal of the bougie) by a profuse hemorrhage from the urethra, which was, however, soon terminated by an injection of cold water.

In consequence of this new symptom, I determined on the application of caustic ; and, after three applications, made in fifteen days, the patient was perfectly relieved, and is now without any return of the disease.

The singularity in this case is, that in the hands of the same practitioner, upon the same

patient, and for the same disease, an opportunity should have been offered for a fair application of opposite modes of treatment, both of which were attended with success:—the one, that by dilatation, temporarily; the other, that by caustic, permanently. The treatment by dilatation was merely palliative, the disease having returned within a month; while that by caustic has, at present, every appearance of permanence. I am not, however, prepared to say, that if, instead of trusting to the patient, I had myself persisted in the treatment by dilatation, a cure may not have been produced by that means: for I yet think that the induration was not then considerable. The treatment by caustic was not succeeded by any dilatation, and yet no disposition to relapse has been manifested.

The hemorrhage which is occasionally presented in the treatment of this disease can, ordinarily, occasion alarm only in the mind of the patient; for the medical man is aware that the vascular system has become capillary before it ramifies on the membrane, and that any hemorrhage may therefore generally be easily suppressed. It is, however, sometimes obstinate, and should be suppressed. The effect of caustic in arresting hemorrhages is nowhere better shown than in this canal.

CASE IV.

John Evans, aged forty, had suffered from three urethral attacks of a suspicious nature during the last three years, the discharge from the urethra having continued uninterruptedly during the whole of that period. A year ago, after a debauch, he suffered during some hours from a total retention of urine, which was, however, relieved by the application of leeches to the perineum and a warm bath. In a few days after this, he observed that the stream of urine was very small. Bougies were employed during nine weeks, and the canal appeared to have attained its ordinary capacity; the dilatation was then abandoned, and for some weeks no appearance of contraction was presented. In about two months after bougies were disused, there was a manifest decrease in the stream of urine, which advanced rapidly, and bougies were again used, with the same success as before; but, in this instance, a fortnight after they had been laid aside, the contraction appeared to be returning. I was now applied to, and, after introducing the model bougie into the canal, immediately proposed the application of caustic, which was readily acceded to. The orifice, however, was so exceedingly small, that I was obliged to employ considerable force before I succeeded in introducing the caustic

into the stricture: little pain was, however, experienced from the operation, and the eschar was ejected on the third day. On the fourth day, after having obtained a fresh model, I made a similar application, and with a similar result. In four days after, another, and again, for the last time, another at the expiration of the third day. No consecutive dilatation was employed; yet the cure was complete.

There, perhaps, never was a case more favourable for the use of instruments: the canal was large, and almost inert, as far as sensibility was concerned. This case strongly exemplifies the truth of the positions I have laid down—first, that dilatation will not succeed, except in a very small number of instances, and only when employed in a very early stage of the disease:—secondly, that, if entire removal of the induration have been effected, the subsequent use of bougies is unnecessary.

CASE V.

A man of twenty-three, of an exceedingly irritable temperament, applied to me under the following circumstances. Seven months before, he had contracted an urethral inflammation, for which he had been requested to use astringent injections. They had appeared to be successful; on three several occasions the discharge had disappeared for two or three days, but

again returned with the usual inconvenience. The injections were rendered very astringent, and he had latterly used them in a proportion of ten grains of sulphate of zinc to an ounce of water. During the last three months he had found the jet of urine gradually decreasing, and at the time he applied to me he was obliged to get up five or six times during the night for the purpose of endeavouring to obtain relief.

On my proposing to introduce a bougie into the canal, he expressed great apprehension; and it was only after much solicitation, and indeed strong remonstrance, that he was induced to submit; and, even then, only on condition that he might introduce it himself. During the introduction he suffered much from rigours, which, upon two or three subsequent occasions, assumed the character of the cold stage of an intermittent fever. On withdrawing the bougie, I found the imprint No. 5, which may be seen in the plate.

I knew it would be perfectly useless to propose to him the use of caustic; and I was confident that he could not support the presence of bougies introduced for the purpose of dilatation. I therefore requested him to call the next day, when he allowed me to introduce what he supposed a sound, but which was really the caustic apparatus. He expressed little sense of pain while the caustic was in contact with

the stricture, merely remarking that "something felt d—d hot." I thought it prudent to conceal from him that caustic had been applied. On the evening of the third day an eschar was evacuated with the first jet of urine; for a moment it was arrested at the orifice, and occasioned much alarm; but this was dissipated by the increased size of the jet which immediately succeeded.

Having first ascertained the progress which had been made by the former application, two more applications of caustic were made; at the expiration whereof, wishing to introduce a large bougie for the purpose of ascertaining the diameter which had been procured, I was induced to inform him of the imposition I had practised. He refused, in spite of my solicitation, to have bougies introduced; and I was reluctantly obliged to let him take his chance. I however found, at the expiration of two months, when he again called on me, that no contraction had occurred; neither has it to this day.

This case made an impression on my mind—first, by the facility with which I was enabled to introduce the caustic without the knowledge of the patient—the pain being so inconsiderable as not to arouse suspicion; and, next, because it first produced in me a conviction that consecutive dilatation was unnecessary.

CASE VI.

Mr. J. had, before the age of twenty, three attacks of urethritis, which were successfully treated by astringent injections. At twenty-five he had another attack, which was similarly treated; but the discharge persisted with great obstinacy, and, soon after this period, he thought he could discover a gradual, though certain, diminution in the jet of urine. From the age of twenty-five to thirty-one he found that slight indiscretions produced retention. These attacks were found to be more frequent in winter, and occasionally accompanied by acute intermittent febrile symptoms. At this period, resort was had to catgut bougies; in the use of which he for some time persisted, without material alleviation. After their suspension, recourse was had to plaster bougies; the employment whereof was continued with great fortitude, but little benefit. During the succeeding two years the difficulty of excretion was very considerable, and the accessions of fever frequent; and he was now become extremely feeble.

Catgut bougies were again employed by a new medical attendant whom he consulted; but it was rarely that he succeeded in introducing the bougie into the bladder. Having, however, more accurately determined the curvature of

the canal, the introductions were made more easily, and the jet of urine was increased. This state of amelioration, however, was suddenly succeeded by retention, for which he was unable to account; and further attempts to introduce the bougie were abortive. In a few days, when the severity of the symptoms had abated, the use of the bougie was again attempted, and the patient became better; but, in spite of their continued use, retention occurred very frequently.

At thirty-five, after being removed from place to place, in the hope of re-establishing his general health, he placed himself under the care of a medical man, in a fashionable watering place, where he was then residing. He was again subjected to treatment by the plaster bougie; but, this time, under less favourable circumstances; for their use was frequently intermitted in consequence of the irritation they produced,—having occasioned swelling of the testicles and a tumour of the perineum, which threatened abscess. By the timely suspension of the bougies, these complications were soon dissipated, and, in another week, the patient was in a condition to be again submitted to treatment. The bougies were had recourse to, and with marked amendment; so that the confidence of the patient re-appeared, and a cure appeared to be at hand. This calm was

of short duration; for the difficulty of excretion became almost as considerable as it had ever been, and without apparent cause; and it was found necessary (after another futile attempt) to abandon entirely the use of bougies. It was at this period that I was consulted by the patient—not so much from any hope of relief as in compliance with the suggestion of a friend.

It was to the patient himself, an exceedingly intelligent man, that I am indebted for the previous history of the case.

At the time he applied to me he was excessively debilitated, suffering from intermittent fever, pain in the stomach, diarrhœa, and excessive weight in the loins. Having introduced a model bougie—at four inches I found a contraction of the canal (not very considerable in extent), which was removed by two applications of caustic. This contraction had, I apprehend, been produced by the irritation occasioned by the frequent introduction of instruments. At six inches I discovered a second contraction, much more extensive, the orifice being scarcely sufficiently large to admit the caustic. This stricture, I found, was extended, and of a hardness almost cartilaginous; and its removal required seven applications of caustic, which were made in twenty-nine days. Immediately behind the last obstruction was a third, similar in character, to which caustic was applied; but,

in consequence of the increased sensibility of the canal around this point, the applications were made with longer intervals. Some of the eschars here were not thrown off for six days. To this latter stricture the application of caustic had been made seven times, and the stream of urine had approached its natural diameter, when the person became impatient, and imagined the cure might be completed by dilatation; he, in consequence, resorted to it, but, from the sensibility of the canal, he was obliged to lay it aside in nine or ten days. I then made two more applications of caustic, the last on the sixth of January last; and, since that period, the patient has had no relapse of any kind.

This case confirms strongly the points I have put in the treatise—first it shews the inefficacy of dilatation in the advanced state of stricture, and, secondly, that the use of dilating bodies, after entire destruction by caustic, is not always practicable or necessary.

CASE VII.

An old man of sixty-three, whose general health was good, had experienced six attacks of urethritis, of which the two latter were treated by astringent injections. An obstinate chronic inflammation, accompanied by discharge, remained; it had occasionally ceased

for a short time, but soon reappeared. Since the last attack of urethritis, he had constantly experienced more or less difficulty in urining, and twice suffered total retention, which was relieved each time by catheterism. From the difficulty which was experienced, and the force which it was necessary to employ in the introduction of the instrument, it was evident that organic stricture existed. A system of dilatation was resorted to, bougies were introduced, and their use persisted in for some time without much amelioration; for, although occasional benefit was derived, no permanent good was effected.

At the time when he made application to me for relief, a desire to urine occurred every quarter of an hour, and obliged him to get up eight or ten times during the night. On introducing the model bougie, I discovered, at four inches and a half from the external opening, a stricture, the orifice of which was so small that I was unable to introduce into it the caustic apparatus or the smallest bougie. I passed into the canal, and placed in contact with the stricture a canula, the size of a number ten bougie; the dilatation which was effected in this manner enabled me to introduce into the canal, through the canula, and pass into the stricture, a catgut bougie of very small size, which I permitted to remain there for a quarter

of an hour. These I renewed until I was enabled to introduce the caustic apparatus; and, in three days, was fortunate enough to penetrate the stricture and place the caustic in contact with the interior of the obstruction. On the evening of the fourth day a considerable eschar accompanied a trifling discharge of urine; but the jet was not perceptibly enlarged. I now passed a small bougie through the stricture, and it was arrested at an inch and a half nearer the neck of the bladder. I succeeded in introducing a catgut bougie, the use of which was persisted in every eight hours until I could apply caustic to the second stricture, which I succeeded in doing with little difficulty; and, at the same time, made a second application to the stricture already cauterized. On the fourth day both eschars were ejected, and the jet of urine was of the size of a crow-quill. Two more applications were made to each of the strictures, and the patient was cured.

The time which was occupied in effecting this cure was little more than four weeks, and recourse was not had to the consecutive employment of bougies.

This case corroborates the position I have laid down, that, in cases of stricture of long standing, bougies cease to be effectual in the removal of stricture; and as clearly shews that dilatation is unnecessary after the in-

duration has been completely removed by cauterization.

CASE VIII.

John Edwards, aged fifty-three, about thirty years ago, fell astride a bar, by which the perineum became considerably contused: he immediately experienced much difficulty in urining, which was succeeded on the following day by complete retention. This was relieved by leeches, warm baths, and other antiphlogistic means; but the jet of urine gradually diminished, and in a few weeks was evacuated drop by drop.

Dilatation by bougies was employed, which, after being persisted in for eighteen or nineteen days, with some relief, produced inflammation of the testicle; and the use of bougies was then discontinued. While orchitis continued, the irritation of the urethra, caused by the obstacle to the passage of the urine, was so great as to produce abscess, which opened immediately behind the scrotum; and through this opening a considerable quantity of urine passed at each evacuation. He then became a patient at St. Bartholomew's Hospital, where he was subjected to the operation of cutting upon the stricture, and then removing the indurated mass. This was performed by Sir J. Earle. Before the cure was complete, he was obliged to leave the Hospital and go into the

country ; and in a few months his state was little better than before the performance of the operation. When he was presented to me, the urine was voided in an exceedingly attenuated jet, and a fistula existed in the perineum, through which a great portion of the urine passed.

Though, after examination, I was of opinion that this was a case in which the stricture might be easily removed by my urethrotome, yet, having once before seen the marked good effect of caustic under similar circumstances, I was induced to employ it; principally, however, from being assured that the fistulous communication with the urethra was situated immediately behind the stricture, and being convinced that the stimulus produced by the caustic would excite a disposition to granulation, which might effect the obliteration of the fistulous opening. Under these circumstances, I made an application of caustic, permitting it to remain in contact with the stricture for more than a minute. The urine was constantly removed by the catheter. The application was attended with very little pain; but it was not until the sixth day that the eschar was thrown off, when the jet of urine was very sensibly increased. In the succeeding three weeks I made three other applications, with similar effects; and, by the end of the fourth week, the fistula had healed, and the

stricture was entirely removed. The man is now in perfect health.

This case clearly shews the assistance we may derive from caustic in the cure of fistulæ in perineo. The caustic being applied to the point where the fistula opens into the urethra, an eschar is formed, which opposes an obstacle to the passage of the urine through the fistula; the irritation excites granulation in the tube, and the obliteration is thus effected. It also illustrates a point of importance—the not unfrequent occurrence of inflamed testicle, in consequence of the irritation produced by the presence of the bougie in the canal.

CASE IX.

An old, infirm man, of sixty-nine, with two old inguinal herniæ, applied to me for relief under the following circumstances. About twenty years before, he had suffered from an urethral affection, which he had permitted to “take its course.” It lasted three or four months, and at the expiration of that period entirely disappeared. In the following year the poor old man had a similar visitation, which he again suffered to pursue its course: but this was less fortunate in its termination than the former; for the urethra had from that time never been free from uneasiness, and, during

the last sixteen years, he had suffered from frequent retention, which had produced the herniæ with which he was afflicted: the bladder had been once punctured, above the pubis; bougies had been introduced; and, on three or four occasions, sounds had been forced with violence through the canal, but had not been, in every instance, succeeded by the excretion of urine. I introduced a small bougie, which was arrested immediately beyond the orifice; and, having with some difficulty passed this obstruction, it was again arrested at an inch and a half further in the canal, and beyond that point it was found impossible to force it. A model being taken, the caustic was immediately applied to the first obstruction, in contact with which it was suffered to remain a minute and a half. Though the caustic did not occasion any very apparent local irritation, it produced considerable general excitement, and appeared to rouse the patient from an almost apathetical indifference into which he had sunk. After the removal of the eschar, I was enabled to pass a No. 10 bougie to the next obstruction. I took a cast of this stricture, which was scarcely pervious, and immediately made another plentiful application of the caustic, expecting to find that, when the second eschar escaped, the jet of urine would be much enlarged. In this I was disappointed; there was no manifest improvement

in the local disease, though the general health of the patient appeared to be improved by the stimulus. I now suspected the existence of a third stricture, which, on introducing a bougie, I discovered, at the distance of four inches and three quarters from the meatus. To this I made a long application of the nitrate; and, when the eschar was ejected, I made an examination of the two former, and determined to cauterize each on the following day. This was done; the eschars were thrown off; the jet of urine was much enlarged; all went well, and the progress towards a cure was rapid—when the patient was carried off by a cerebral affection—apoplectic in its character. I was not allowed to make a post-mortem examination.

This case is valuable, in shewing to what extent the nitrate of silver may be safely applied to old men; and, instead of producing unpleasant consequences, it appears in this case to have roused, in an extraordinary manner, the expiring energies of old age. The unusual situation of these strictures indicates, I apprehend, that they owed their production to the violence to which the canal had been subjected.

CASE X.

A man, aged thirty-two, had, two years before, suffered from urethritis; the discharge from which, after the inflammatory symptoms

had subsided, continued obstinate ; but, on the use of astringent injections, terminated. Since that period the discharge had twice returned, accompanied with pain at a defined point near the fossa navicularis. The patient had, of late, detected a decrease in the size of the stream of urine, which had induced him to apprehend total retention. Having introduced a small bougie, and finding it arrested at an inch from the orifice—having taken, by means of the prepared bougie, a model of the obstruction, and finding the orifice of the stricture very small—I introduced the caustic, which I suffered to remain a very short period only : but, although no violence had been used, the application was in a few minutes succeeded by a considerable discharge of blood, and alarming general and local irritation, for which I found it necessary to resort to very energetic means of relief. The orifice of the urethra and the prepuce became frightfully tumefied, and I had much apprehension that gangrene would supervene. Retention was so complete, that it was proposed to puncture the bladder ; but it was determined to try previously the effect of immersion for an hour or two in a warm bath. This was done, and before the expiration of the second hour the urine was evacuated, with less pain than was anticipated. When the symptoms had so far subsided as to justify such a course, bougies

were introduced, and dilatation to the fullest extent effected. He still persists in the use of bougies twice a week; and this is the only inconvenience he suffers.

This case is sufficiently marked to shew us that much reserve is necessary in the use of caustic, and that, in young and middle-aged persons, it is very necessary to ascertain whether the disposition to inflammation is, under ordinary circumstances, very marked; and, if so, much hesitation should be felt in cauterizing.

CASE XI.

A man, of thirty-five, of a sanguine temperament and exceedingly irritable, had experienced, before he was twenty-five years of age, four attacks of urethral inflammation; during the existence of which, from the extent of the inflammatory symptoms, it had been found necessary that he should lose blood, locally and generally, and in each case a very energetic antiphlogistic mode of treatment had been resorted to. During the last attack he had suffered from what appears to have been considerable symptomatic fever, and to have been subjected, during five weeks, to much depletion. During the existence of this attack, the urethral affection appears to have subsided; but, when he had recovered from the fever, he found a considerable and increasing discharge from the

urethra, unaccompanied by much irritation. It resisted the usual applications: copaiba and the other resins were administered in various doses without any benefit; astringent injections were employed with the same want of success; and, although occasionally much amelioration was experienced, the discharge never entirely disappeared. During the last seven or eight months the jet of urine gradually diminished, and in the last month he had twice suffered from total retention, which had been, however, partially relieved by blood-letting and warm baths. An attempt was made to introduce the catheter, which was ineffectual, but was not relinquished until after considerable violence had been used.

Under these circumstances, he was presented to me. A prepared bougie was introduced, and was arrested at four inches from the meatus; when withdrawn, it presented evidence of almost total obliteration of the canal. He suffered so much rigour and uneasiness from the application, as to induce me to postpone until the next day the application of the caustic, which he much dreaded. Being unable to introduce the caustic, I resorted to the use of the instrument I proposed for adoption, with which I slightly incised the stricture, so as to make room for the entrance of the caustic. A very slight application was then made, which occa-

sioned little pain, and which, to the great joy of the patient, was attended by a sedative effect. Until the rejection of the eschar, no other amelioration than this appeared to be produced; but on the third day a very considerable eschar was ejected, in consistency much like horn. The jet became very much enlarged, and the patient now expressed much anxiety to have the caustic again applied. On the following morning it was again introduced, and suffered to remain in contact with the stricture for more than a minute. The same good effect was apparently experienced which attended the former application; and at the termination of the fourth day the eschar was discharged with the urine; and, to the patient's great joy, the jet appeared of nearly its natural size. I now meant to resort to dilatation; but the patient expressed so strong a desire to have another application of caustic made, that I felt little disposed to resist his entreaties, and I again cauterized the stricture very superficially. The eschar from this application made its appearance on the third morning, and every thing was, as the patient expressed it, "as it used to be." He felt very much inclined to resist the use of bougies; but consented to introduce one weekly, and to allow it to remain in the canal for an hour.

About ten weeks afterwards, he came to

express his gratitude for the cure which I had effected. The jet of urine was of its natural size, and the discharge from the urethra had for some weeks entirely ceased.

This case is interesting in two points of view: in the one as shewing the sedative effects of caustic when applied to an irritable urethra; and this can only be explained, I apprehend, by supposing that the seat of irritation was fortunately in intimate sympathetic connection with the spot where the nitrate of silver was applied, and that, upon the loss of vitality produced in the tissue by the caustic, the cessation of irritability was consequent: in the other, as exemplifying the power which I have before stated caustic to possess—that of so far changing the character of a tissue, as to terminate an obstinate discharge.

CASE XII.

A man of twenty-eight had suffered twice from urethritis, each of which had been treated without stimulants. Between the first and second attack the discharge had twice reappeared in consequence of some slight excesses he had committed. The obstinacy which characterized the second attack induced his medical attendant to use astringent injections, which effected, it is true, a cessation of the discharge, but only by creating an inflammation in

the canal so acute as almost to produce a retention of urine. From this he recovered by the aid of antiphlogistics; but the urethra remained during some years very irritable. In five years afterwards, in consequence of excesses at table, the retention became complete. By means of local and general bleeding, and active depletion, the power of excretion returned; but with every error in regimen he experienced a return of the former symptoms.

When I saw him he presented an appearance of much suffering. The bladder had become extremely irritable, and the desire to urinate incessant. I introduced a model bougie into the canal, which was arrested at five inches and a quarter from the meatus. The orifice of the stricture was found not to be larger than a silk thread, and from the application of the model bougie he suffered much irritation. For four days I made attempts to penetrate the stricture without success; and I became apprehensive that the only method of treatment which could be resorted to, with any hopes of success, was that of Hunter*, and I determined upon applying the caustic to the anterior part of the stricture; the application was attended with much pain; and an obstinate retention for

* This case occurred before the invention of the instrument to which I have already alluded.

between eight and nine hours, which succeeded it, occasioned some alarm. In four days after, I made a second application, similar to the first, and with as much pain; a fresh retention succeeded, accompanied by much general excitement, which prevented me from making another application during the succeeding fortnight. At the end of this period, hoping that the cauterization had destroyed the greater portion of the stricture, I determined to make another application, which was again attended with similar results. From this time any little hope of relief which he had entertained became dissipated; and, as I felt that there was really no certainty that I was cauterizing the stricture only, I did not urge the necessity of a fresh application. Before, however, he left town, being free from irritation, I requested to be allowed to introduce a model sound; at the same time assuring him that, if I did not immediately succeed, I would use no violence, but withdraw the instrument. To my great surprise, however, I found that the stricture had been destroyed, and that I was able to approach an inch nearer to the bladder, where the instrument was again arrested and presented a tube of about a line and a half of diameter. Into this I then had no difficulty in introducing the caustic apparatus, and in five days the jet was of nearly its natural size. Dilatation was now resorted to, and in

five weeks the patient left me, having quite recovered a free passage. This case illustrates forcibly the danger with which this method of applying caustic is pregnant, being attended in each instance by retention, which served to prostrate the little energy the patient before possessed. Consecutive dilatation was resorted to in this case, in consequence of a conviction I felt that the healthy tissue had been destroyed, which would, I feared, be succeeded by a considerable cicatrix; but, if moulded on a bougie, I knew it would not be accompanied by a contraction of the canal. Hitherto no other course could be pursued in these cases; but now I trust the modification I propose in the application of caustic will render it unnecessary to resort to a method of treatment which is often so painful in its operation and so uncertain in its effects. I have no doubt that in this case the submucous cellular tissue had retained, through the whole period, the irritation which had been communicated to it when the canal was first affected.

CASE XIII.

A man of forty-six had suffered from three attacks of urethritis, neither of which had been effectually cured before the appearance of the other. During many months bougies had been employed unsuccessfully; and, whilst he was subjected to that mode of treatment, two abscesses

had occurred in the perineum, and were succeeded by fistulæ. Cauterization had been subsequently resorted to, and it was stated that two strictures, situated in the anterior portion of the canal, had been removed by caustic, applied to their anterior surface. When I saw him, he stated that the disease had existed about eight years, and that during that period excretion of urine had only been effected with extreme difficulty: phymosis existed, and it was not without some difficulty that the orifice of the urethra could be found. I introduced into the urethra a model bougie, which was arrested at six inches from the orifice; and, when withdrawn, a delicate capillary tube indicated the diameter of the orifice of the stricture. After two consultations with the medical men attached to the hospital in which I found him, I determined to employ the cutting instrument. This was perhaps not strictly prudent, especially in testing the merits of a new mode of operation; for I was unable to introduce the stiletto into the orifice of the stricture, and was therefore deprived of the use of a portion of the instrument which I have ever considered indispensable to the safety of the operation. The penis was, however, short, and the stricture situated so profoundly, that I concluded, if I were to find it necessary to cut into the bladder, it might be effected without much difficulty or danger; I

therefore gave the penis a direction by which the urethra approached as closely as possible to a straight line, bringing it down very nearly to the thighs; I then introduced the instrument, keeping the penis firmly extended upon it, and placed the instrument in a straight line for the neck of the bladder; I then incised the strictured portion for the distance of fourteen lines, without being enabled to enter the bladder. Under these circumstances, and from the impatience manifested by the patient, I considered it prudent to withdraw the instrument and to introduce a sound; which was placed against the stricture for the purpose of securing the progress which had been made. The patient did not suffer much pain, nor was there any more than two drachms of blood lost. I was, however, obliged to leave the place on the following day, and have not since heard of the case.

This is the only case in which I have not met with the most perfect success in using my instrument; and in this case I should have felt it my duty to have entered the bladder if I had had the assistance of the stiletto, which would have assured me that I was not removed from the canal.

CASE XIV.

A man of sixty-two, in a state of idiotcy, was presented to me, in a workhouse in London,

who, during the whole time of his residence there (nearly nine years), had occasionally made water only drop by drop. Bougies had on two or three occasions been resorted to, but always without success. I first introduced as far as the stricture a bougie, and the kind of resistance which was presented to its further progress convinced me it was of extreme hardness.

From the extreme obstinacy of his character, from the resistance which he always opposed to any attempts which were made for his relief, and from the presumed character of the stricture, I determined on applying my cutting instrument. I first introduced the canula, which I placed in direct contact with the stricture; I then, without much difficulty, passed the stiletto through the orifice of the stricture, and, on withdrawing it as far as possible, I found that the stricture was about four lines in length. I then brought into contact with the stricture the cutting portion, and, after four revolutions of it, liberated the stiletto; I withdrew the instrument from the canal, and found it contained the indurated matter forming the stricture: I immediately introduced a No. 8 elastic gum catheter into the bladder, for the purpose of protecting the incised portion of the canal. After five days I explored the canal, and, finding the calibre still less than in the healthy state, I determined upon trying the effect of a single

application of caustic, which was made after the eschar was ejected: the stream was of its natural size, and, although I wished afterwards to be allowed to introduce a bougie for the purpose of ascertaining the diameter which had been procured, I was never permitted to do so.

He is now perfectly free from any disorder of the canal, although eight months have elapsed since the operation was made. Other cases of treatment by incision which I have in my possession are so similar, that I think it unnecessary to introduce them here. If the natural diameter of the canal have not been restored, I have invariably made a single application of caustic in a few days after incision, for the purpose of removing any indurated matter which may remain. I have never resorted to any consecutive dilatation.

The following case I have introduced for the purpose of shewing that, contrary to general opinion, stricture may exist in the prostatic portion of the canal.

STRICTURE, ATTENDED WITH HEMORRHAGE,
7½ INCHES (LALLEMAND).

A man of thirty years of age contracted an urethritis, which was treated with mercurial

pills with apparent success. Since that period, however, sexual connection frequently produced a muco-purulent discharge, which was often accompanied or followed by hemorrhage. The emission of urine was difficult, attended by severe pain at the curvature of the canal. He entered the hospital the thirty-first of August; he had still an abundant discharge from the urethra. The model sound was introduced into the urethra and arrested at seven inches and a half, and, upon its removal, was immediately succeeded by an abundant hemorrhage. The stricture was found to have considerable extent, and was destroyed by four cauterizations, performed on the first, sixth, twelfth, and twenty-first of September. The excessive sensibility of the canal and the astonishing disposition to hemorrhage occasioned much difficulty in the treatment. Each application of the model sound was accompanied by vivid pain and followed by more or less abundant hemorrhages: the cauterization was attended by the same accidents, in spite of every precaution which was taken; for instance, the sound was withdrawn without cauterizing every time that it failed to enter the obstacle at the first attempt. Whenever the caustic was removed from the canula, a portion of it was dissolved (by the blood which escaped) and carried upon the healthy portion of the canal. Yet, with these disadvan-

tages, four applications sufficed to remove a stricture of the extent of nine lines. Much pain existed in the urethra; so much so as to render it necessary that an interval of nine days should occur between the last two applications. The last operation was accompanied by a more considerable solution of the caustic; and the membrane was cauterized more or less from the stricture to the gland.

This case exhibits the difficulty which is presented in the treatment of stricture attended with pain and a disposition to hemorrhage on the slightest contact, especially if the stricture be situated so profoundly in the canal. The inconvenience of cauterization is not here disguised or lessened: but what means can replace it? Dilatation? The patient could not suffer it for even a few moments, and it constantly produced hemorrhage.

In the second part of Lallemand's work may be found the details of several cases in which the obstruction existed between seven and eight inches from the meatus; and also the particulars of one post-mortem examination in which the constriction existed in the prostatic portion.

CHAPTER II.

PUNCTURE OF THE BLADDER; OPERATION BY
THE RECTUM, THE PERINEUM, AND ABOVE
THE PUBIS.

THE only modes which have hitherto been generally employed for relieving patients suffering from obstinate retention of urine, are forced catheterism and puncture of the bladder. As I have already expressed my opinion of the former operation, I shall here confine myself to a simple consideration of the question, as to which of the different operations which have been introduced for this purpose a preference should be accorded.

THE OPERATION IN PERINEO.

The operation of puncturing the bladder through the perineum was, according to Heister, introduced in 1648 by Riolan*. Thevenin†, in 1658, speaks of the necessity of adopting, with regard to it, certain rules. Heister has given to these rules more precision than they before possessed.

* *Enchiridium Anatomicum et Pathologicum.*

† *Œuvres*, Paris 1658.

This simple statement will place us in a condition to estimate the claims of Garengéot* to priority, and will enable us to detect the errors into which Soemmering has fallen, in stating that to Latta we owed the operation. Soemmering should have recollected that Tolet† performed the operation in 1677.

I shall not occupy time in describing the various modifications to which this operation has been subject, nor the manner in which the operation should be performed; they may be found in all surgical works: but I shall proceed to point out the objections to the operation which I believe to exist.

Most surgeons agree as to the great inconveniences which were attendant upon it. Bichat pointed out, as a fatal objection, the false routes. Indeed, if the point of the trocar be directed outwards, it may glide by the side of the bladder; if inwards, it may traverse the prostate; if forwards, it may pass between the bladder and the pubis; if backwards, it may wound the vesiculæ seminales or rectum. Soemmering says we may have hemorrhage from wounding an artery—augmentation of inflammation—that the presence of the canula prevents the patient from sitting or standing. Sabatier says that in

* *Traité des Operations de Chirurgie*, prem. edit. 1720.

† *Traité de la Lithotomie*, xvii, 8.

this operation we are never certain of the march of the trocar, and may not pierce the bladder, which changes its position according as it is more or less distended. Murray, Weitbrecht, and Reid, cite cases where it has failed, and where recourse was had to other modes of puncture. Callisen says that it cannot be practised in all cases; for instance, when the prostate is tumefied. Boyer says that it requires more dexterity in the operator than do the others. I believe this operation is universally abandoned by British surgeons, and I shall not therefore enter further into the question.

OPERATION BY THE RECTUM.

Claude Flurant, Chirurgien Major à l'Hôpital de la Charité at Lyons, invented this operation. He first employed it in 1760*.

In this operation much discussion has arisen as to whether a canula should be retained in the bladder after its performance. Its presence is often insupportable; and it was in such a case that Mr. Hamilton determined upon its removal. Hey is also of opinion that it should be withdrawn; and, if the wound heal before the urine passes by the urethra, that another puncture should

* Pouteau, *Mélanges de Chirurgie*, Lyons 1760. Klose, *Diss. de Paracentesi Vesicæ Urinariæ per Intestinum Rectum*, Genæ 1791.

be made. This is also the opinion of Professor Cooper.

The only remark I think it necessary to make on this point is, that, in exposing the patient to the chance of two or three punctures, we augment the inconveniences attendant upon the operation.

The partisans of the method are Callisen, S. Cooper, Murray, Sabatier, Howship, Rainard, and Hey. They think that this method is more generally applicable than any other—that, practised far from the seat of disease, it does not expose the patient to infiltration. They say that it more completely empties the bladder—causes less pain, since we have neither skin nor muscles to penetrate—and that it is exempt from all difficulty.

The persons who most decidedly object to the operation are Boyer, Soemmering, Palletta, Sir A. Cooper, Carpue, and Chopart. Their reasons for doing so are—that the distended bladder may be so far removed, that we are not able to puncture it—that the canula irritates the rectum and produces painful tenesmus—that the patient can neither sit nor lie on his back without being much incommoded by the presence of the instrument—that the exploration with the indicator finger is excessively painful to some patients—that occasionally we may be exposed to wound the peritoneum—that the

operation by the rectum is sometimes impracticable, in consequence of the existence of tumours between the bladder and the rectum, which prevent the finger from appreciating the distension of the former—that this operation exposes us to wound the vesiculæ seminales—that it cannot be practised if the anus be constricted, if piles exist, or if the rectum be scirrhous—that the opening may remain fistulous—that it is not practicable in cases where the retention of urine is the result of a contusion which has produced inflammation of the perineum or prostate—and that the trocar may pierce one of the hemorrhoidal arteries.

HYPOGASTRIC OPERATION.

Tubier*, Mery†, and Morard‡, were the first persons who recommended this operation. It soon obtained many partisans, and was subjected to many modifications, which it is not my intention to particularize in this place. Among the number of its partisans we find Heister, Côme, Sharp, Lassus, Schreger, Bonn, Richter, Chopart, Desault, Sabatier, Langenbeck, Boyer, Ducamp, and a majority of British surgeons. Among those who decidedly dislike

* Mem. of the Med. Soc. of London, vol. i, p. 117.

† Hecker, Aunalen der Gesammten Medécin.

‡ Traité de la Lithot. p. 45, t. i, No. 1810.

it are Marcard, Callisen, and Mursinna. Undoubtedly, if the superiority of a method of operation might be decided by the number of its partisans, we should be compelled to give a preference to this operation: but as, in surgery as well as other sciences, conviction does not, or at least should not, arise without an attentive examination, we shall be enabled by such a course to attach a just value to the advantages and inconveniences of this method. I shall now merely enter into a brief consideration of the two operations—by the rectum and above the pubis.

If the necessity for puncturing the bladder arrive, it is surely of the greatest importance that we should avoid all other lesions of important organs, especially of one so closely connected with it as the rectum, the wounding of which cannot be altogether unattended with danger.

One of the objections I have stated is of peculiar importance and should never be lost sight of: I mean the possibility of making the puncture too high, by which we inevitably wound the peritoneum. This is much more likely to occur in the recto-vesical than in the hypogastric operation; for the peritoneum extends much further over the posterior than the anterior surface of the bladder, and is therefore more easily wounded in the former than in

the latter situation. The quantity of the surface of the bladder which is covered by the peritoneum is in inverse proportion with the extension of the organ; and, when the bladder is full, we find it uncovered by the peritoneum, and in contact with the abdominal parietes, immediately above the pubic symphises: so that in proportion to the urgency of the symptoms of retention is the facility of relief afforded by the hypogastric operation. In that operation the bladder need not ordinarily be punctured until we have obtained ocular demonstration that the peritoneum is not involved. In the recto-vesical operation, as the finger is the only guide, no such facility is afforded. Suppose then that, as far as injury to the peritoneum is concerned, we contrast the objections connected with either operation; the danger of infiltration is present in both cases, and yet the consequences of the recto-vesical are much more serious than those attendant on the pubic operations. The recto-vesical operation is attended by an extravasation of the urine, and of the fæcal matter contained in the rectum, into the cellular tissue: while, if the operation above the pubis should unfortunately be accompanied by infiltration, it is not complicated by the presence of fæcal matter. The operation by the rectum affects the bladder in the point which is already irritated, contracted spasmodically, painful, and often even inflamed

by the acrid matter deposited by the urine. Ought we then, under such circumstances, to augment the irritation, tumefaction, spasm, or inflammation, by wounding this part?

With respect to the canula, the presence of which is required, it will certainly occasion more inconvenience in the rectum than above the pubis; and the necessity of removing the canula whenever the patient goes to stool is of itself a serious inconvenience. The operation by the rectum is impracticable if the prostate be much enlarged, as well as when the neck of the bladder is inflamed; and hemorrhoids also prevent or complicate this operation. Some persons have manifested a predilection for the operation by the rectum, from its being more promptly performed. This, though true in some cases, and simply, I conceive, in those where much fat is deposited above the pubis, is decidedly not so in all. It has been stated that the recto-vesical operation should have the preference when the bladder fills only the lesser pelvis, and is not sufficiently elevated to be felt above the pubis. This objection is, however, untenable; for, if the bladder be healthy, and yet so little distended as not to be felt above the pubis, there cannot be much necessity for the operation; whilst, if the bladder be naturally small, or if any affection be opposed to its distension, the puncture from the rectum must be equally ob-

jectionable to that above the pubis. I, however cannot admit that the smallness of the bladder ought to induce us to renounce the pubic operation; for we are always sure to find the bladder applied to the posterior surface of the pubis; and if we introduce the finger into the opening made in the abdominal parietes, we shall have no difficulty in distinguishing the organ, and may then puncture without danger. The great objection to this operation which has prevailed, from the fear of extravasation and infiltration into the abdominal cavity or the surrounding cellular tissue, has little rational foundation. There can be no danger of the former accident, unless culpable negligence have occurred in the performance of the operation; and so firm is the contraction of the parietes of the bladder around the canula, that the chances of the latter should occasion no disquietude. Ample testimony of this fact is afforded by every day's experience. Sandifort never, in a single instance, experienced this accident; and, if we take the testimonies to the superiority of the operation, found in the authors I have named, or afforded by experience, the prudence of operating above the pubis must be unhesitatingly conceded. When the reader may refer to the talented works of Heister, Frère Côme, Lecat, Turner, Lucas, Desault, Murray, Bell, Pelletan, Palletta, Schmidt, Bonn,

Nauche, Home, Abernethy, and others, on puncture of the bladder, it must be superfluous in me to enlarge this chapter ; but, from what has been already advanced, we may safely conclude that, unless the hypogastric region be the seat of any injury, or that the superior surface of the bladder be inflamed, without a similar affection of its inferior surface, the pubic operation is more certain, more easy, more convenient, shorter, and less dangerous, than the rectovesical ; and, whilst in the latter there may be cause to apprehend fatal complication, there can be no reason to apprehend such complication in the former.

One other method has been employed for the purpose of relieving the patient in cases of retention, which was I believe proposed by Sir Charles Bell:—it is, to cut upon the urethra behind the stricture, and by this means to empty the bladder. For the success of this operation, one thing is necessary ; and, when this circumstance is present, I will frankly admit that the operation promises a certain quantity of success. The distension produced by the urine which is found between the stricture and the neck of the bladder must be sufficient to form a tumour, which will project into the perineum. In the absence of this polar star, we make our incision and cut at random, and we may or may not enter the urethra.

In some cases the depth of matter intervening between the urethra and the surface of the perineum is not less than three inches; and, in such a case, no one will maintain that the distended urethra could possibly make a projection on the surface of the perineum. In this case, in the absence of an instrument in the urethra, in the absence of the tumour in the perineum, I believe it will be admitted that the dangers with which I invest the operation are not imaginary: at best, only one good attends the operation—the relief of the distended bladder; and I maintain that, with a common degree of care, a puncture through the urethra, or through the parietes of the bladder, will not often be necessary. The stricture still remains, and the incision which we make will generally be so far removed from the stricture, that little more facility can be afforded in its removal than before the performance of the operation. In looking at the operation of cutting upon the urethra behind the stricture, I should say, with Desault, that unless we can introduce a catheter to the point on which we are to cut, the operation is embarrassing; and that if we can, it is no longer necessary. It has been recommended to open the urethra, upon the beak of the sound, or catheter, introduced as far as the stricture, then to seek the natural opening of the canal and to cut upon the beak of the sound, after which it is

passed into the bladder. This operation presents no advantage; the incision is made beyond the obstacle, between it and the bladder; it does not affect the cause of the retention; and, to arrive at the probability of a radical cure, a long course of dilatation must be resorted to. Desault, in speaking of the operation, says, "A short exposition sufficed to enable us to form a just appreciation of the value of the operation. The progress of art, in the treatment of disease of the urinary passages, has already almost, and will entirely, banish from practice this useless operation."

CHAPTER III.

ABSCESSSES AND FISTULE: THEIR TREATMENT.

ABSCESSSES never constitute primitive diseases, but are always an effect of previous inflammation, which has presented a more or less intense character: indeed, wherever we find suppuration, and whatever appearance it may present, we may be assured that an irritation of an acute or chronic kind, apparent or concealed, has existed or exists, either in the situation occupied by the abscess, or in some situation more or less removed from, but communicating, either by continuity or sympathy, with the point where the suppuration is found. All the symptoms which precede suppuration, and which accompany the development of abscess, are dependent upon the violence, the seat, and the progress, of the inflammation by which they are accompanied. Abscessses, then, have all the same origin—inflammation: but the exciting causes of inflammation are innumerable. It is, therefore, imperative upon us to study carefully the modifications which they present, according to the character of the inflammation by which they are produced, and the nature of the organs

in which they are situated. It is not, however, my intention to enter generally into the symptoms and treatment of abscess, but to restrict myself to the subject of perineal abscess—the only kind that, under ordinary circumstances, can interfere with the excretion of urine.

Abscesses of the perineum may be produced by external injury, or by the infiltration of a greater or less quantity of urine into the cellular tissue, in consequence of a more or less considerable rupture of the parietes of the urethra or bladder; and such infiltration is incomparably the more frequent and the more serious of the exciting causes of these abscesses.

The situation in which abscesses of the perineum are found is not uniform, and is to some extent dependent on the portion of the canal in which the rupture or other injury is situated. Rupture of the urethra rarely occurs in the absence of stricture, and is produced generally in the following manner: a stricture having existed for some time, and having become almost impervious, it is found that, after every attempt to evacuate the bladder, and these attempts are in such cases extremely frequent, a portion of the urine which has passed out of the bladder is retained between the neck of that organ and the stricture, which, by its presence and the distension it occasions, excites irritation or inflammation in that situation. If the inflammation

and the distension, consequent upon the presence of this fluid, have existed for some time, the cohesion of the mucous membrane is destroyed, and it becomes so enfeebled and stretched, that it is either actually ruptured, or (if its continuity be yet entire) allows of the transudation of a few drops of urine. This extravasated fluid is then effused into the surrounding cellular tissue and excites inflammation, which is generally succeeded by abscess. Occasionally, however, the progress of the disease is different; the urine diffuses itself through the cellular tissue, and excites an inflammation so violent in its character as to be succeeded by gangrene. A case is mentioned by Segalas where a gangrene was developed in the scrotum from this cause, and from thence, in spite of the immediate introduction of a catheter and the evacuation of the fluid contained in the bladder, it involved successively the right groin, the upper portion of the corresponding thigh, and the right-side of the abdomen; the skin and cellular tissue being destroyed over a surface of two square feet. These abscesses may also be produced by irritation in the urethra, occasioned by the presence of a foreign body in the canal.

The portion of the canal which becomes ruptured is most commonly the bulbous, or membranous. This is readily explained by the fact that the great majority of strictures have been

found to exist at the curvature of the canal ; so that between the curvature and the prostate we should naturally expect that rupture would occur. It is also generally found that rupture takes place at the inferior part of the membranous portion of the canal. Wherever the abscess is found, if it result from the extravasation into the cellular tissue of an irritating fluid, augmenting perhaps at each instant, and in the same proportion extending the inflammation, it should be promptly opened. This should be done as soon as the slightest fluctuation becomes apparent, or even before we have very distinct evidence of the existence of pus. In these cases, an irritating fluid being infiltrated in the tissues, all our efforts to prevent the progress of the disease will be vain ; and incision, for the purpose of giving the fluid as well as the pus which may be formed a mode of escape, is the first means which should be employed. In any case, the abscess should never be permitted to open spontaneously ; for there will then be found in the wound but little tendency to close. This is explained by the circumstance that the opening is preceded by a thinning of the parietes ; the derm is denuded of its cellular tissue, and is then in an unfavourable condition for cicatrization ; while the borders of an opening, made in an early stage with a cutting instrument, comprehend the skin, and a more or less considerable

quantity of subcutaneous tissue, which has soon a tendency to become tumefied, to be placed in contact, and to unite by the first intention. It is certain that the early use of incision is the treatment to which every judicious practitioner should resort; but, if the abscess have been produced by an extravasation of urine, and if the communication with the urethra or bladder be still preserved, even this means will rarely prevent the occurrence of fistulæ.

FISTULÆ.

As the great majority of abscesses in this region are a consequence of the escape of a certain quantity of urine, it is evident that when they are opened they establish a communication between the urethra or the bladder and the exterior, and constitute true fistulæ. Although these fistulæ may occur in any portion of the urinary passages, they are fortunately, however, much more common in the urethra than the bladder.

No sooner is there established, in any part of the body, a permanent morbid secretion, than this secretion manifests a tendency to make its way to the surface of the integument by which it is confined. No sooner does a fluid, excremential or other, experience any interruption in its natural channel, than it forms for itself a new one. In either case, an accidental channel

is established, by which the morbid or other secretion is transmitted to the surface. It is to these channels that the term fistula, or fistulous communication, has been attached. In the urethra they are generally produced by an obstacle to the passage of the urine, occasioned by a stricture or other obstruction in that canal. Occasionally they are caused more by the attempts to remove stricture, than by the difficulty or impossibility of excreting the urine; but usually they are a consequence of abscess. However they may be formed, when once established, they are easily distinguished, from the nature of the fluid they furnish; and which, if in the urethra, only flows at those times when the patient evacuates his urine: and in quantity proportioned to the extent of the communication with, and to the degree of contraction of, the canal. Their seat constantly varies; sometimes we see them in the groin, around the anus, in the thickness of the nates, &c. ordinarily, however, the perineum is the seat where we find them, even when we find others existing in the situations I have named. Cases will occur, though unfrequently, in which an abscess of the perineum, if left to itself and suffered to open spontaneously, will open into the urethra; and here, supposing stricture to exist, and the opening into the urethra to occur posterior to the stricture, it is found that the urine, being inter-

rupted in its course by the stricture, enters into the cavity and occasions all the aggravation which is so frequently produced by extensive infiltration. If, however, the opening be anterior to the obstacle, which is unfrequent, the canal is here free, and the urine, being no longer impeded, may pass over the opening without entering the sac.

Without considering more at length the causes of urinary fistulæ, I shall proceed to consider the mode in which it will be most prudent that they should be treated.

In the treatment of fistulæ we should never lose sight of this great principle—remove the causes which have produced, and which preserve, the disease; so that foreign bodies, if they exist, should be removed, strictures destroyed, and the free excretion of urine established, before we proceed to the obliteration of the fistulous canal. It has been, and still is, the custom to accomplish this indication by introducing into the bladder a catheter, which is retained there until the cicatrization has been effected. To that practice I make this objection—the constant presence of an instrument in the canal produces an habitual excitation, and a permanent secretion of mucus, which is opposed to the cicatrization of such openings. It is no easy thing to prevent the urine from passing along the canal of the urethra. In the one

case, the organ is rapidly enlarged ; and yet a new catheter is with difficulty introduced, in consequence of the exactitude of the relations ; and an instrument is never accurately embraced by the urethra for more than twenty-four hours : in the other case, the sound penetrates into the bladder, which becomes irritated and contracts incessantly, by which the urine is constantly ejected by the catheter and the canal at the same time. If the canal be not filled by the sound, and if the fluid be not prevented from passing between the instrument and the canal, their obliteration is impossible. It will be more prudent that we shall methodically remove the obstacle, and establish the freedom of the canal, and that we should introduce a catheter only when the patient desires to urinate. To this frequent introduction of the catheter some objections may be made. Catheterism may be very painful, or the catheter may have a tendency to enter the internal orifice of the fistula : in either case, it may be better that, when once introduced, it be permitted to remain, than that the excitation should be too frequently renewed. In those cases where the urethral secretion is considerable, where the bladder is irritated, where the presence of the sound is ill supported, it is absolutely necessary to abandon this means and to recur to catheterism as often as required. Without enumerating the different modes which

have been proposed for the cure of fistulæ, I shall proceed to state that, in old fistulæ, in consequence of a conviction that the means already indicated were insufficient, and that a stimulation was necessary, I have adopted a treatment from which I have experienced the greatest success. I apply the lunar caustic to that portion of the urethra on which the internal orifice of the fistula is situated. If we apply caustic to a stricture, we most frequently find that, from the contiguity of the stricture to the orifice of the fistula, we excite in it an inflammation which produces a disposition to granulation and to a closing of the orifice. It will, of course, be always prudent, in these cases, if practicable, to introduce a catheter for the purpose of emptying the bladder, and to remove it immediately after the bladder has been emptied. I am firmly persuaded that the caustic favours the cicatrization of a fistulous ulcer, and that its action in these cases is analogous to that which it exercises on sluggish ulcers on the surface of the body to which it may be applied.

A patient had a complete urethral fistula, which had been closed at four different periods during the time that catheters were retained in the canal, and as frequently reopened after their employment had been suspended. Caustic was applied to a stricture which existed in the canal, and with which the internal orifice of the

fistula was in intimate connection. After five applications of caustic, the fistula still existed, and gave issue to a very small quantity of urine ; but was much contracted. Three more applications of the caustic were made before the stricture was entirely removed ; and in a few days afterwards the fistula was closed, and has since remained so. In conclusion, I would reiterate, that the great object, of which we should never lose sight in the treatment of urinary fistulæ, is—first to remove the obstacle to the free excretion of urine ; and, when that has been effected, no difficulty will generally be experienced in removing the fistulous disease.

The presence of fistulæ, or even of simple urinary tumours, are always serious diseases : the danger of the abscess is proportioned to its volume, to the rapidity of its progress, and to the nature of the obstacle to the free excretion of urine : the gravity of a fistula is proportioned to the time of its existence, to the age of its subject, and to the state of his constitution. It is evident that a small, indolent, urinary tumour, which has remained stationary for a long time, is a much less dangerous disease than a considerable abscess, the parietes of which are in a few days menaced with gangrene. It is equally evident that, in a young and healthy subject, an abscess, or a simple fistula, will be a much less serious disease than in an old, enfeebled subject.

CHAPTER IV.

DISEASES OF THE PROSTATE—INFLAMMATION,
ACUTE AND CHRONIC, AND THEIR TERMINA-
TIONS—HEMORRHAGE, VARICOSE VEINS—AND
THEIR TREATMENT.

THE prostate gland, embracing the neck of the bladder and the commencement of the urethra, cannot become tumefied without interfering with the excretion of urine, and even preventing entirely the performance of that function, if the tumefaction be considerable.

It would seem that this gland ought to be rarely subject to disease ; for it is so profoundly situated as to avoid most external injuries : but its connection with the urethra, the bladder, and the ejaculatory canals, expose it to be affected whenever diseases affect these organs.

The diseases to which the prostate is subject are modifications of inflammation. Inflammation of the prostate may be produced by abuses, either solitary or otherwise, of the sexual organs, by inflammation of the urethra, of the testicles, of the bladder, of the anus, or of the perineum, by hemorrhoidal tumours, by the

presence of calculi in the bladder, by equitation, by sitting for too long a time each day, by the contact of sounds, &c. Inflammation of this organ is much more frequently of a chronic than of an acute character. Acute inflammation of the prostate is always prompt in its development and rapid in its progress. It is announced by an extreme uneasiness, a sense of fulness, tension, weight, and heat, which extends from the superior part of the perineum and the neck of the bladder towards the anus. These sensations are soon replaced by a fixed, continued, and pulsatile pain, which is increased by the slightest pressure upon the perineum, and each time the patient goes to stool. Violent tenesmus and continual desire to urinate are also experienced. The patient complains of a foreign body in the rectum; and, if the finger be introduced, we feel, at the anterior part of the rectum, a projection caused by the prostate, and which is so sensible that he can scarcely support the slightest contact. When he attempts to urinate, it is long before the first drops appear; and the contraction of the diaphragm and abdominal muscles, instead of hastening its appearance, have the opposite effect: they oppose to it a new obstacle; for they apply the neck of the bladder against the tumour more firmly than before; so that the opening of the urethra becomes by this mecha-

nism entirely closed. The urine in its passage causes a burning sensation, and it flows by a very delicate jet, gradually lessening until it only passes drop by drop, or not at all. In this respect, much variety is observed, according as the entire of the prostate may be tumefied, obstructing more or less completely the urethra, or that the inflammation may affect more particularly certain portions of the gland, by which it may project more on one side than the other. A sound, introduced into the urethra, easily penetrates as far as the prostate; for, until then, it meets no obstacle; but when it arrives there, it is arrested; and, if we endeavour to push it forward, its contact causes a burning pain. The pulse is full, hard, and frequent; the thirst more or less intense; in fact, fever is manifested, with all the general symptoms of great inflammation. The disease usually lasts eight or nine days, and terminates in resolution. Sometimes it terminates by suppuration, frequently by becoming chronic, and very rarely by gangrene. In these three latter circumstances, it always becomes a grave disease, and may terminate fatally. When acute inflammation of the prostate is terminated in suppuration, which is not unfrequent, the symptoms persist beyond the time I have mentioned: the patient has fever, accompanied by frequent rigours: towards evening the pain diminishes

a little, and the difficulty in urining is not so great ; by means of the finger, when introduced into the rectum, we distinguish a fluctuating tumour. The suppuration does not appear to attack the gland itself, but only its envelope and the cellular tissue disseminated around its lobules. Sometimes the cellular tissue of the organ is as it were infiltrated with purulent matter ; sometimes the pus is collected into many small points ; sometimes it forms a considerable collection, which almost always points towards the external face of the gland, on the side of either the bladder or the rectum, rarely at its internal face, in the interior of the bladder or of the urethra. Suppuration of the prostate is always serious, often mortal, and an accident against which surgery has few resources.

Most frequently, as I have stated, this organ becomes affected with inflammation of a chronic character, which renders it more voluminous, and occasions in its texture alterations of various kinds, which have generally been confounded under the common denomination scirrhus. Sometimes it becomes soft, and may be easily destroyed ; sometimes it attains a consistency analogous to that of fibrous or cartilaginous tissues, and, when we split it, we find it firm, of a whitish brown colour, divided into cells by membranous septa which traverse it

in different directions. Chronic inflammation of the prostate increases with extreme slowness. Perhaps this may be a reason why we so rarely meet it in young men, while it is so common at the approach of age. Indeed, there are few libertines who do not suffer from it when they become old, and who do not thus expiate the errors of youth. The gland frequently attains a magnitude double or triple that which it possesses in health, being, according to Hunter and Wichmann, occasionally of the size of a goose egg, or, according to Petit, of the size of the fist, and of the weight of nine ounces. Its increase of volume may occur in its middle portion, and in that point which corresponds to the vesical orifice of the urethra, or only on its lateral parts, or both at the same time. In this last case, the orifice of the canal is found elevated towards the symphysis pubis, at the same time that the urethra experiences a lateral pressure; so that frequently the urethra, at its origin, seems to plunge into the prostate, where it forms a cul de sac. In the first case, the vesical orifice is elevated towards the symphysis. In the second case, the canal is merely compressed, without experiencing a sensible deviation. All these shades, the description of which may appear minute, are important to know, in consequence of the influence which they exercise upon the difficulties which are experienced in

catheterism. Induration is generally produced at the same time with the increase of volume; and this we may distinguish by introducing the finger into the rectum: we find the tumour hard, and little pain is experienced by the contact of the finger with it. This affection produces constraint in the functions of the rectum, accompanied by a sense of weight at the margin of the anus and a constant tenesmus. It produces, occasionally, symptoms similar to those which are caused by stone in the bladder, except in one important point—that they are rarely, if ever, manifested before the appearance of ischury. The urine becomes viscid and stringy, and deposits, in cooling, long, glairy, elastic filaments, which exhibit the appearance of a trembling gelatinous mass, adhering to the bottom of the vessel with much tenacity, and sometimes suffering itself to be elongated to the length of two feet before it is detached.

For the purpose of overcoming acute inflammation of the prostate, it is necessary to adopt a most energetic antiphlogistic treatment: this is the only method by which we can hope to put an end to this alarming affection. All authors, Morgagni, Petit, Chopart, Bell, Home, &c. are in entire accordance on this point. General bleedings ought to take precedence of every other means; they should be

succeeded by numerous and frequent applications of leeches to the perineum, general and partial baths, fomentations, &c. The application of refrigerants upon the perineum has sometimes been very useful; but, in the application of ice or very cold water, much reserve must be shewn; for, although it will now and then succeed in allaying the pain which is such a distressing accompaniment to the disease, yet, if its application be long continued, it will now and then produce a frightful state of collapse. The diet should be very spare, and the repose absolute, in a horizontal position, the thighs separated, and the pelvis a little elevated to avoid all compression. The liquid ingesta should be only just sufficient to quench the thirst. If the inflammation have not abated, and if the retention of urine persist, which is rarely the case when the energetic means to which I have alluded have been employed, it may become urgently requisite that we should empty the bladder; and for this purpose catheterism has been usually recommended. Desault used gum elastic catheters, of large size, believing that they penetrated the bladder with less difficulty than smaller ones. He ordered that, when the instrument had arrived at the prostate, and was in a good direction, we should employ force; because it would be easier to force the instrument through the contracted

canal than through the substance of the gland. Such is also the opinion of Boyer. Home recommends that we should not sound, except in urgent cases: he directs that the sound should be very gently introduced, to avoid irritation. Lisfranc counsels, in these cases, the use of the conical sound. Indeed, it is generally held, in these cases, that puncture of the bladder is an extreme remedy, and that it should not be employed until we are convinced, by repeated attempts to accomplish catheterism, that it is impossible to arrive at the bladder without producing a false passage. But, as we have only acquired this conviction after reiterated attempts, and perhaps after the production of fearful accidents, and after having added to the existing irritation, it will be much more prudent to abstain entirely from catheterism, unless we observe the judicious precautions given by Home; and, when we meet a powerful obstacle, without multiplying uselessly our painful attempts, resort at once to puncture of the bladder above the pubis—an operation as simple as inoffensive; for the patient scarcely feels the trocar in the midst of the extreme suffering by which he is already prostrated. Undoubtedly this mode of proceeding may be less brilliant than forced catheterism; but, as certainly, it occasions less inconvenience, and more surely attains the end, which is to remove an alarming

symptom without aggravating the principal disease. We must never neglect the energetic employment of every remedy calculated to remove this acute inflammation: it is our only safeguard against a termination in suppuration, by which the life of the patient is placed in much danger.

It is possible that the pus may be collected in one point, and that we may possess the means of giving it issue; but when, as is most usual, the pus pervades the cellular tissue of the organ, neither nature nor art possess the means of effecting its removal. The suppuration proceeds, slow fever is developed, the situation of the patient is loathsome and miserable, and he dies of marasmus.

Chronic inflammation of the prostate is more frequently manifested as an original affection than as a mode of termination of that which possessed an acute character: it is an affection of a very serious kind; because the gland, when once affected by it, very rarely acquires its primitive character. In chronic inflammation of the prostate, with the exception of general bleedings, our mode of treatment should be similar to that employed in acute:—leeches, or cupping-glasses, frequently applied to the perineum or the inside of the thighs, fomentations, and a regular kind of life, always procure much alleviation, if they do not, in

time, effect a cure. A revulsive treatment has also been much recommended; and among the means which have been most efficaciously employed are blisters and setons to the perineum. Bell states that he has derived much advantage from cauterization, applied on either side of the raphe; and they have appeared to him to afford as much more advantage as the peas which were introduced penetrated more profoundly. Revulsives, applied at a greater distance from the seat of disease, are said to be occasionally useful. Among all those which have been recommended, there are none which do not frequently fail; even the hydrochlorate of ammonia, which Fischer and Kunzmann speak of as a specific, when taken in doses of a dram twice a day. The decoction of cicuta, in conjunction with bark, was the remedy of Heberden: Valentine used, in America, the extract of cicuta in large doses with much success: Bell, who has employed this medicine, says that its exhibition has never been attended with permanent benefit: "if," says he, "during a short time it has appeared to produce relief, it has never been permanent." Bell speaks favourably of the decoction of mezereon, in conjunction with sarsaparilla; but he adds, that the relief thus obtained has never been sufficiently decided to enable him to speak with much certainty. Girtauner is sanguine in the effi-

cacy of burnt sponge. As to mercury, Bell says that it has never really diminished the tumour—that it generally augments the irritability of the system, whatever precautions may be observed in its administration; and that the affected part usually becomes, during its use, more painful than before: so that this medicine is not only useless, but dangerous. Such was also the opinion of Heberden. My own observations incline me to believe this conclusion to be too sweeping: that it is applicable to friction I believe; but I think mercurials, prudently administered, do not act more unfavourably than other irritating substances. The introduction into the urethra of sounds and catheters has been much employed in this disease, and, it is said, with much success; but my own observations are not sufficiently numerous to enable me to bear testimony to their good effects.

There is a singularity about diseases of the prostate, which is not, however, uncommon in lobulated organs; it is the facility with which one lobe may be affected with a chronic disease while the other portions remain healthy. This has been particularly pointed out by Morgagni and Home, in that portion of the prostate which has been termed, by the latter gentleman, the middle lobe. When this middle lobe is moderately tumefied, it presents a ma-

mellated form, and is directed towards the cavity of the bladder; if it become more voluminous, it forms a species of transverse replication, which is extended from one lateral lobe to the other: in each case, it elevates and pushes before it the mucous membrane of the bladder; and, when the patient attempts to urinate, it is pushed forward, and forms a kind of valve, which prevents the escape of the urine. When, however, the bladder is so full that its anterior part is directed downwards, the tumour is pushed downwards and backwards, and the urine may flow; some, however, always remains in the bladder, the quantity daily increasing in a ratio with the progressive increase of the tumour, and, not unfrequently, as much as a pint may remain after the patient believes he has evacuated the whole. This lobe has occasionally acquired the volume of a pullet's egg. It is seldom, in such a case, that the lateral lobes remain free from disease; ordinarily, the one or the other, or both, are augmented in volume.

At any period of life below fifty, it is rare that the middle lobe acquires such a volume as to occasion retention of urine, although the prostate may have acquired a great volume. At an early period of life, the tumefaction of this gland may cease; in old age, we cannot hope for such an occurrence. The portions of

the middle and lateral lobes which project into the bladder are sometimes ulcerated, and sometimes fungous; in these cases, the patient suffers violent pain in urining, or in the passage of instruments into the bladder.

Hemorrhage from the prostate is occasionally presented. Home, having seen, near the external surface of the middle lobe of the prostate, a vein which was ruptured during equitation, endeavours to establish a ridiculous comparison between inflammation of the prostate and apoplexy. The prostate, when affected by ulceration or suppuration, may, and does not unfrequently, pour out a certain quantity of blood; but it is, I think, difficult to believe that equitation shall produce hemorrhage from this organ, when the lobe is simply tumefied. The blood escapes, mixed with the urine, and is coagulated; or it does not escape until after the urine. In the latter case, the presumption is, that it arrives from the bladder: but, if any injury exist in the urethra, we are naturally disposed to refer it to this cause. A man of fifty-five rendered bloody urine after riding: after having urined, there followed a quantity of black blood, which appeared to come from the bladder: the health was otherwise good, and the horse-exercise was continued. At the age of fifty-nine, after riding farther and faster than usual, the quantity of blood was more con-

siderable, and the urine flowed involuntarily : a fortnight after, these symptoms re-appeared ; the urine, which had always been sanguinolent, was then limpid : ultimately, he died in consequence of suppression of urine. The bladder was found empty, the middle lobe of the prostate tumefied very considerably, the lateral lobes were very voluminous and rounded on their opposed parietes ; at the most elevated part of the middle lobe, was a vein, ruptured, filled with half-coagulated blood. This hemorrhage does not, when moderate, require any treatment ; for it may be useful. When it is so abundant as to exhaust the patient, ice, or other cold applications, should be made to the perineum.

There is one more disease by which the volume of the prostate becomes much increased ; I mean a varicosed enlargement of that plexus of veins which is found under the fibrous membrane covering the prostate. This disease is one of extreme obstinacy, and is not uncommon in old men, in those who have inhabited warm countries, or who have been frequently affected with gonorrhœa or hemorrhoids, complicated with any intestinal obstructions ; or even in young men, who have indulged much in sexual intercourse or spirituous liquors. This varicose state of these vessels appears to have much analogy with hemorrhoids, and presents almost the

same character with those tumours with which they are too often complicated. Both diseases are increased by similar causes, especially by the efforts made to urine or stool; for, at this time, the contraction of the abdominal muscles compresses strongly the viscera contained in that cavity, and has necessarily a tendency to prevent the return of the blood by the iliac and mesenteric veins; augmenting, by this means, the congestion of the veins in the perineum and neck of the bladder. These varices are sometimes observed in men, in the vigour of age, who have not been exposed to any of the causes to which I have alluded; they may depend, then, on a general state of plethora, on a sedentary mode of life, on the habit of resisting too long the desire to urine, and on the use of dress which compresses too strongly the abdomen. The mode by which we are most likely to establish the existence of this disease, is by observing the indolence and little sensibility which the enlarged prostate exhibits, by the absence of smarting during the passage of urine, and the slowness with which retention is produced.

In these cases it has been usual to introduce a large sound, which not unfrequently produces a profuse hemorrhage; and this has been attended by the most marked amelioration. The object to be pursued, is to employ those means

which are most likely to disencumber the enlarged vessels of their contents. For this purpose, we apply leeches to the perineum; and these alone will frequently remove a retention proceeding from this cause. Cold bathings, used generally, or applied locally to the perineum, and repose, the most absolute, are always useful. The introduction of elastic sounds is frequently beneficial: by means of the pressure they produce upon the varicose vessels, in the neighbourhood of the neck of the bladder, they strengthen them, and may re-establish their tonic power. But all these means are most frequently only palliative. In spite of the best directed efforts of medical skill, diseases of the prostate in men, even before the approach of old age, are extremely difficult to cure, and too frequently terminate in abscess or indurations, constituting some of the most distressing and loathsome diseases to which human nature is subjected. If a difficulty occur in the treatment of this disease, before the occurrence of one of its most fatal complications, I mean old age, it becomes then, as may naturally be supposed, much more obstinate, and we can scarcely hope that any remedies we may use will occasion more than temporary relief. It may be noticed, that, with respect to abscesses in the perineum and diseases of the prostate, the observations I have made with regard to

treatment are extremely general. This has been intentional on my part; for, in the great majority of cases, some complication will be presented to remove them from the pale of particular rules, and to require a treatment varying with the peculiar circumstances of each case: success must then depend, in a very great degree, upon the discretion of the person to whose care they have been committed.

EXPLANATION OF THE PLATES.

PLATE I.

FIG. 1.—The model sound. it is formed as follows: we take a hollow bougie; through this we draw, as firmly as possible, a mesh of cotton; when it has arrived near the extremity, we cut off the cotton which has been drawn through, leaving about half an inch projecting beyond the bougie; this is dipped into a composition formed of equal parts of bees' wax, diachylon, and shoemakers' wax, is allowed to cool, and is then rolled between two pieces of wood or stone until it becomes in diameter nearly uniform with the other portion of the bougie.

FIG. 2 is intended to represent a strictured urethra, into which the model bougie has been introduced: it has taken the character of the orifice as well as of the anterior portion of the stricture.

FIG. 3.—The model bougie, removed from the canal, bearing the impress of the stricture.

FIG. 4 .It occasionally occurs that the orifice of a stricture is removed from the centre of the canal; in this case, we pass the instrument bearing the caustic, or indeed a small catgut bougie through this instrument, and are enabled, by the bolster at its extremity, to elevate or depress it at pleasure.

FIG. 5.—A caustic apparatus: *a* the canula; *b* the instrument bearing the caustic.

FIG. 6.—The portion of the instrument which bears the caustic: *a* a platina tube; *b* a canal into which the caustic is placed; the heat of a lamp, over which it should be held, will fuse the caustic, and so prevent the possibility of its escaping.

FIG. 7 and 8.—Similar instruments, curved.

FIG. 9.—An urethra into which the cauterizing instrument has been introduced: *a a* the canal; *b b* the strictured portion; *c* the caustic instrument, with the caustic within the stricture.

FIG. 10.—Similar to the former, except that the orifice of the stricture is not in the centre of the canal; here we see the utility of the instrument FIG. 4.

PLATE II.

FIG. 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, are figures which were presented by the model bougie upon being withdrawn from the urethra: they are faithful impresses of the characters of certain strictures, to which allusion has already been made.

The figures under FIG. 7, 8, and 9, and along side of FIG. 10, are placed merely to shew more plainly the character of the canal in those several cases.

FIG. 11 is a model of a sound which is, as nearly as possible, adapted to the shape of the canal of the urethra in the adult: the length should be from ten to twelve inches.

FIG. 12 is the urethrotome introduced into a strictured canal: *a a* the canal; *b b* the strictured portion; *c* the stiletto, which has been pushed through the stricture and then withdrawn as far as the obstacle, serving as a director and also enabling us to estimate the length of the stricture, the canula being against the anterior and the stiletto against the posterior part of the obstacle; *d* the cutting instrument, which is projected and has incised half of the induration; *e* the canula; *f* a screw placed upon the cutting instrument, by which we are able to limit the quantity of the instrument which we shall project.

FIG. 13 is the instrument by which I open a passage into the stricture for the caustic; at its extremity are presented four delicate cutting edges of a conical form; the tube or stem is of silver, and can be bent to any shape, by which we can adapt it to any portion of the canal.

FINIS.

1 to 10 - Similar to the former except that the office
of the witness is not in the name of the court; but in
the name of the instrument.

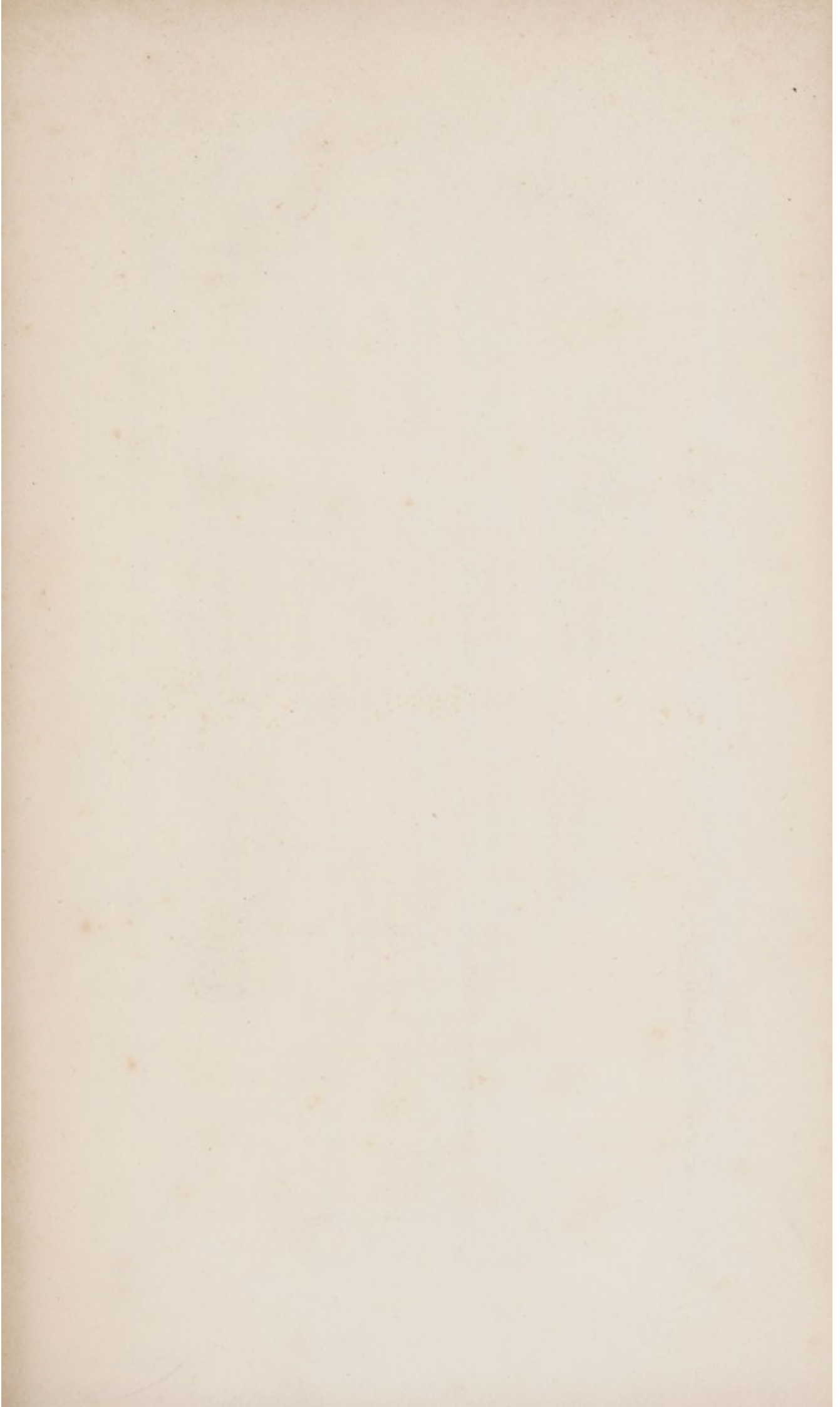
11 to 15 - Similar to the former except that the office
of the witness is not in the name of the court; but in
the name of the instrument.

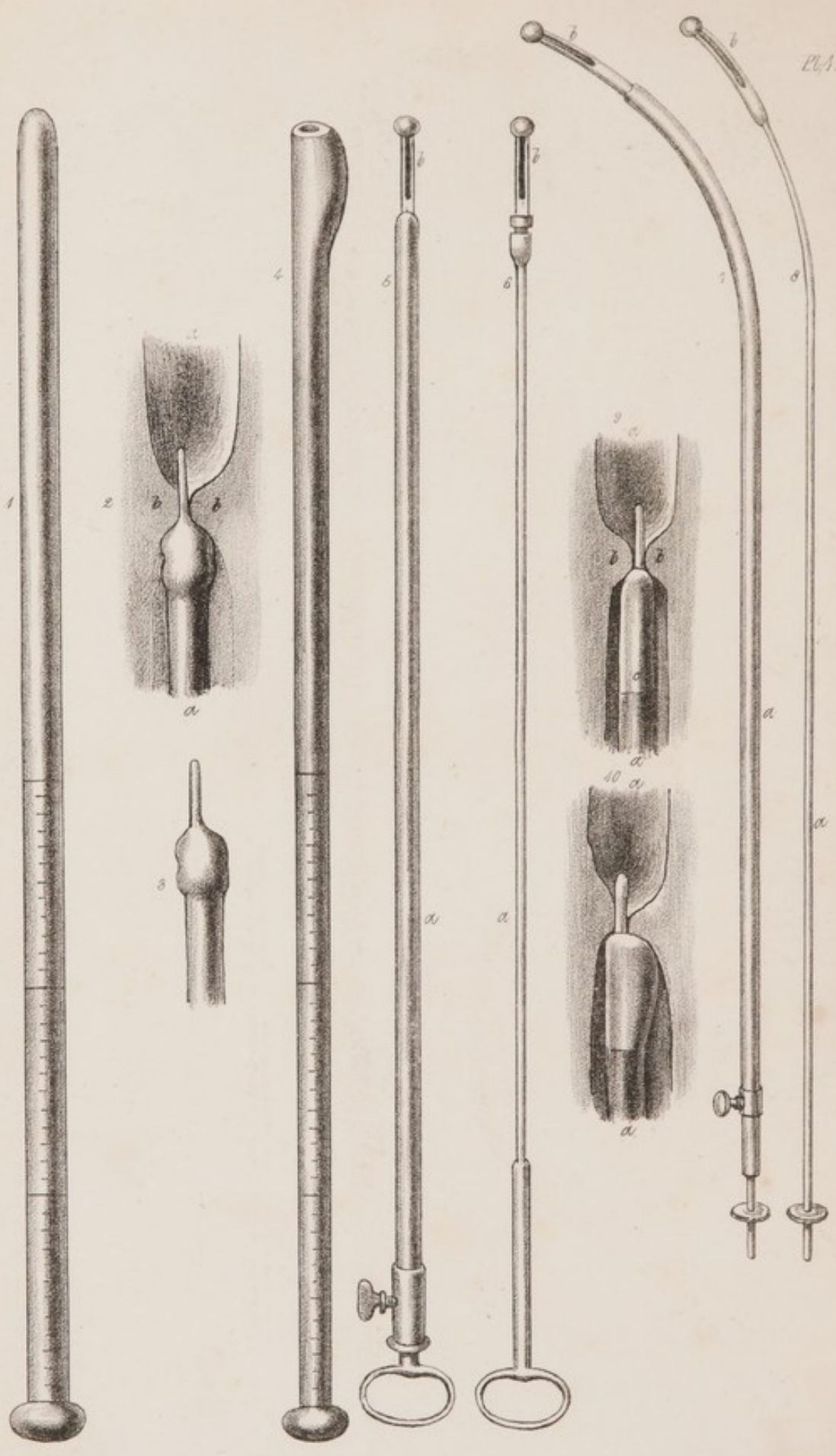
16 to 20 - Similar to the former except that the office
of the witness is not in the name of the court; but in
the name of the instrument.

21 to 25 - Similar to the former except that the office
of the witness is not in the name of the court; but in
the name of the instrument.

26 to 30 - Similar to the former except that the office
of the witness is not in the name of the court; but in
the name of the instrument.

31 to 35 - Similar to the former except that the office
of the witness is not in the name of the court; but in
the name of the instrument.





PLA.

