

These may be applied to the eye by means of any of the ingenious "droppers" which the shops afford, or, if the patient can slightly open and close the lids, he may diffuse the solution over his eye by throwing back the head until the plane of the face becomes horizontal, then closing both eyes, and dropping a little of the solution (not too cold) over the inner canthus of the one to be medicated. Now, by several times rapidly opening both eyes to their widest extent and then shutting them, the fluid enters the eye and circulates over the globe. This method does not succeed with strong solutions, causing pain, and should not be used with solutions which stain the skin. Nitrate of silver should always be applied by an experienced hand, and be brought into contact with every portion of the conjunctiva.

The inflammation once reduced to a subacute state, tends to get well slowly. The discharge drags along on an average for from two to four weeks—often longer. In these cases blisters behind the ears, on the temples, seton at the nucha, etc., have been recommended, together with plenty of good food, fresh air, tonics, stimulants, etc.

Granular conjunctivitis and anterior staphyloma may be mentioned as not very rare complications of gonorrhoeal conjunctivitis. They have no essential connection with gonorrhoea, and the student is referred for their treatment to works on diseases of the eye.

## CHAPTER V.

### STRICTURE OF THE URETHRA.

Definition.—Varieties: Muscular, Organic.—Organic Stricture.—Form.—Number.—Seat.—The Lesion in Stricture.—Causes.—Time of Occurrence of Stricture.—Irritable and Resilient Stricture.

AN unnatural narrowness of any portion of the canal of the urethra constitutes stricture; or, since the urethra is naturally a shut canal, Sir Charles Bell's definition may be more accurate, and any loss of dilatibility may be termed stricture. This contraction of the canal, following the first definition, to constitute stricture, must be unnatural, for the urethra has certain points of normal contraction—namely, the meatus and the beginning of the membranous urethra, and these are not strictures. They become so, however, if they are unduly small. Thus, an individual with an average-sized penis and urethra, whose meatus will only take No. 8 or 9, has stricture (congenital) of the meatus, although he may never suffer any inconvenience therefrom. Again, any inflammatory condition of the walls of the canal, or spasmodic contraction of the same, constitutes stricture, as does also any growth upon or beneath

the mucous membrane—cancerous, tubercular, syphilitic, membranous, polypoid.<sup>1</sup>

A collection of fluid outside the canal may constitute stricture, abscess, serous or hydatid cyst, etc.—any thing, in short, which lessens the size of the canal when distended by the stream of urine—foreign bodies of course excepted. In all the last-named conditions, however, stricture is only an epiphenomenon, and not the disease itself.

In this section, pure stricture only will be discussed.

Stricture is of two kinds: 1. Muscular, or spasmodic; 2. Permanent, or organic—the latter congenital, or acquired. Inflammatory stricture does not exist as a disease of the urethra. The smallest amount of inflammation will lessen the calibre of the canal, just in proportion to the amount of turgescence of the mucous membrane; but this is unimportant. No amount of simple inflammation of the urethral mucous membrane gives rise to enough diminution of the size of the canal to occasion serious inconvenience (retention), unless occurring in connection with organic stricture, assisted by muscular spasm or complicated by prostatic congestion. A croupous membrane may exist within the urethra and obstruct more or less the flow of urine; but this is exceedingly uncommon. Rokitansky<sup>2</sup> speaks of "very rare cases" where "we find primary croup occurring on the urethral mucous membrane"—this chiefly in children. Membranous deposits may occur upon the surface of organic stricture, or behind it; but these are not to be confounded with true croup.

1. MUSCULAR OR SPASMODIC STRICTURE.—Spasmodic stricture is of the commonest occurrence; but, as in the case of inflammation, unless complicating preëxisting organic stricture, it is usually an affection of no special importance. The predisposing cause of spasmodic stricture is a sensitive, high-strung, nervous organization, often in connection with an irritable, gouty, or rheumatic constitution, and particularly in those whose sexual functions are not regularly exercised. The exciting causes are any local irritation, inflammation, foreign body, irritation of the rectum (reflex action), ingestion of certain substances, cantharides, turpentine, etc., mental emotions, malaria. The seat of contraction is in the unstriped muscular fibres which surround the urethra at the irritated point (stricture, foreign body), or at the membranous urethra in the voluntary "cut-off" muscle.

The action of many of these causes may be readily illustrated. Take a nervous, excitable young man with a healthy urethra—*a fortiori*, with an irritable bladder or inflamed urethra—and attempt to pass a

<sup>1</sup> (Polypi very rarely grow in the spongy urethra. They are chiefly found—discovered after death—in the prostatic sinus; sometimes in the fossa navicularis, where they can be felt and seen during life. Their symptoms are those of stricture. When within reach, they may be excised or torn away, and the base from which they grow cauterized. They seem always to spring from the floor of the urethra.—Beyran, "Polyopes de l'Urètre chez l'Homme."—*Gaz. Méd.*, 47, 1863.)

<sup>2</sup> Sydenham translation, vol. ii., p. 235.

bougie for the first time, and the chances are that it will be arrested. It may be grasped and firmly held at any part of the canal, but this is more liable to occur just as the instrument is entering the membranous urethra, where its point may be detained for many minutes by an involuntary contraction of the cut-off muscles. If the end of the sound is held quietly for a few moments against the contracting muscle, the spasm will yield and the instrument pass on into the bladder. Any foreign body in the urethra is liable to excite this amount of spasm around it. If any portion of the canal is in a state of irritation, especially if slight organic stricture exist (this is a potent cause of spasm), some contraction is almost certain to take place at this point on the approach of an instrument, and to recur after the sound has passed along, giving the sensation of "grasping" or "biting" upon the instrument, which is so well marked in most strictures.

The spasm caused by cantharides is attended by a good deal of congestion as well. It is styled strangury—a term too well known to require further comment.

What surgeon has not witnessed spasmodic stricture, caused by modesty or shame, perhaps anxiety, fear, irritated mind (Cooper), as shown by the total inability of some patients to pass water before a class of students or even in the presence of a physician alone in his office.<sup>1</sup> In such cases there is not a failure of the detrusor urinæ to contract, but there is failure of the compressor urethræ to relax. The patient contracts his abdominal muscles and his diaphragm, and uses all his will, but to no purpose. Let the surgeon now gently introduce a well-warmed and oiled catheter of medium size into the bladder, and the spirt that will follow, as soon as its eye touches urine, will easily convince him that there is no fault to find with the contraction of the detrusor.

Whether malaria alone can cause spasmodic stricture is doubtful, but certainly there are two cases on record<sup>2</sup> where spasmodic stricture occurred paroxysmally every twenty-four or forty-eight hours, and was cured by quinine after other means had failed.

As instances of spasmodic stricture from neighboring irritation and reflex action, may be cited retention coming on suddenly in connection with inflamed hemorrhoids after operations near the anus, especially where the sphincter ani has not been paralyzed by section or stretching; retention occurring with irritable ulcer, or even from worms. Thompson, quoting Tuffnell,<sup>3</sup> gives a case where all the symptoms of stricture existed, and where a diagnosis of stricture of the membranous urethra

<sup>1</sup> In one (personal) case, from this cause, a patient waited one hour and a half before he could pass water, and that too in a closet adjoining the office with the door partly closed. His bladder was moderately full, he had no organic stricture, and was doing his best.

<sup>2</sup> Thompson, *op. cit.*; and B. Brodie, *Medical Gazette*, vol. i., p. 107.

<sup>3</sup> *Dublin Medical Press*.

was made, when it was discovered that the patient had tape-worm. The latter was treated, and after the worm had been discharged the stricture and its symptoms disappeared.

Strongly concentrated acid urine may occasion spasmodic stricture in a gouty individual, attended by more or less congestion—perhaps positive inflammation—and this all the more readily if there be a small amount of organic stricture.

Certain forms of lumbar neuralgia attended by painful spasmodic contraction of the urethra have been described by Neucourt.<sup>1</sup>

DIAGNOSIS.—Spasmodic stricture always occurs suddenly, the stream of urine between the paroxysms being of normal size. This difference is sufficient to distinguish it from organic stricture where the stream is permanently small.

*Treatment* consists in the discovery and removal of the cause, paying special attention to sexual irregularities, the gouty diathesis, concentrated urine, and points of congestion, or commencing organic stricture in the urethra. Retention produced by simple spasm can always be relieved by the hot bath, rest, and an opiate, or at once by an anæsthetic and the catheter. Belladonna seems powerless.

PERMANENT OR ORGANIC STRICTURE.—Congenital stricture has been described (*see* ATRESIA). Here we have to do with organic stricture, the result of a previous pathological process.

FORM OF STRICTURE.—All strictures may be ranged under three heads: (a) linear, (b) annular, (c) tortuous.

(a.) *Linear Stricture*.—Here the stricture is like what would be caused if a thread were tied around the canal (Fig. 24); or it may consist of a thin membranous diaphragm, with its orifice at the centre or on one side; or be a crescentic fold or free band, encircling the urethra entirely or partially in a transverse or oblique direction. It is single or multiple.

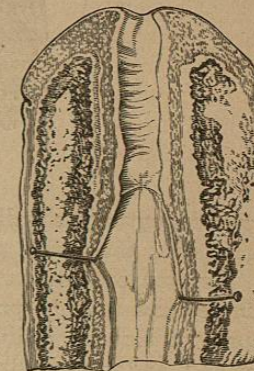


FIG. 24.—(Voillemier.)

(b.) *Annular Stricture*.—This form is broader, as if a flat tape had been tied around the canal (Fig. 25). The term is applied to strictures not over a quarter of an inch long.

(c.) *Tortuous or Irregular Stricture*.—Here all other varieties come in. Such a stricture may be an inch or more long—even the whole pendulous urethra may be in a hardened, stiffened, narrowed condition.

The amount of contraction in stricture varies from an almost imperceptible narrowing of the canal to nearly absolute occlusion, so that, after death, it may be impossible to introduce even a bristle through it. Absolute occlusion does not occur except after the canal has been sev-

<sup>1</sup> *Archiv. Gén.*, July, 1858.

ered by an injury, and the urine has found an escape through the wound; or where numerous large fistulæ have long existed, giving exit to all the urine. The urethra in front of a stricture always continues pervious, whether urine pass through it or not; although, from lack of ha-

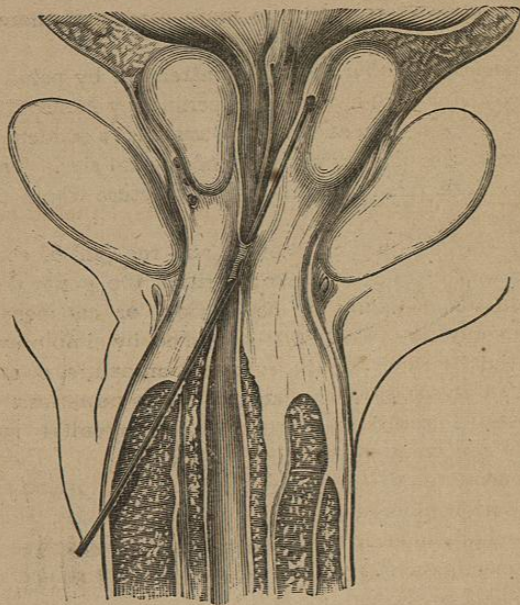


FIG. 25.—(Dittel.)

bitual distention, its walls are liable to become somewhat rigid, sensibly diminishing the normal proportions of the canal.

**NUMBER OF STRICTURES.**—Stricture is usually single. Out of two hundred and seventy preparations, showing stricture, found in the museums of London, Edinburgh and Paris, Thompson<sup>1</sup> found, in two hundred and twenty-six cases, solitary stricture. Hunter saw, in a single urethra, six; Lallemand, seven; Colot, eight; Leroy d'Etiolles, eleven—the latter on a living subject. Thompson has seen three—at most four—and believes that if more are found they must be considered as irregular contractions of the same stricture.

**SEAT OF STRICTURE.**—Upon this subject the laborious investigations of Thompson, upon the two hundred and seventy specimens above referred to, must be considered final, especially as daily experience with patients bears out the truth of his conclusions. He divides the urethra into three regions:

1. The bulbo-membranous, including one inch in front of and three-

<sup>1</sup> "Stricture of the Urethra," third edition, 1869.

quarters of an inch behind the junction of the spongy with the membranous urethra.

2. From the anterior limit of region one, to within two and one-half inches of the meatus, embracing from two and one-half to three inches of the spongy urethra.

3. The first two and one-half inches of the canal from the meatus.

The two hundred and seventy preparations showed three hundred and twenty strictures.

Region 1 contained 215 strictures—67 per cent.

"	2	"	51	"	16	"
"	3	"	54	"	17	"

There were 185 cases of one stricture only, situated in region 1.

"	"	17	"	"	"	"	"	"	2.
"	"	24	"	"	"	"	"	"	3.

Thompson did not find in any preparation, or upon any living patient, or in any autopsy, a prostatic stricture. Walsh<sup>1</sup> describes a stricture in the museum of the Royal College of Surgeons, Dublin, as commencing in the posterior part of the membranous and extending into the prostatic urethra. Leroy d'Etiolles<sup>2</sup> says that he has in his collection one specimen showing prostatic stricture. Ricord<sup>3</sup> narrates that he has encountered it, and Civiale<sup>4</sup> makes the same assertion. In brief, the situation of organic stricture is as follows: Most frequently in the bulbo-membranous urethra, sometimes as far back as the posterior part of the membranous portion—that is, at a distance varying from four and one-half to six and one-half inches from the meatus. Next in the first two and one-half inches of the canal, usually just at the meatus, or at the posterior limit of the fossa navicularis, and finally at some intermediate point in the spongy urethra. Prostatic stricture, formerly considered so common, may be said practically never to occur. The frequency of stricture at the bulb and fossa navicularis is explained by the greater vascularity of these portions of the canal, and the greater amount of erectile tissue found there. It is well known that gonorrhœal inflammation tends to settle upon these localities, after the rest of the mucous membrane has returned to its normal condition. Injury inflicted by the rough use of the nozzle of a syringe, in injecting the canal, probably has something to do with the subsequent formation of stricture near the meatus. Traumatic stricture most often invests the membranous urethra, just beneath the sub-pubic ligament.

**THE LESION IN STRICTURE.**—The morbid change in organic stricture may be a mere thickening of the mucous membrane, the surface having lost its polish, being congested, and perhaps covered with granulations.

<sup>1</sup> *Dub. Med. Press*, January, 1856.

<sup>2</sup> "Des Rétrécissements de l'Urèthre," Paris, 1845, p. 83.

<sup>3</sup> Notes to Hunter on Venereal, second edition, Philadelphia, 1859, p. 168.

<sup>4</sup> "Maladies des Organes genito-urinaires," sec. ed., Paris, 1850, vol. i., p. 158.

These changes are the result of chronic inflammation, and resemble those which occur in any tegumentary structure of the body which is kept in a condition of mild chronic inflammation; namely, there is a proliferation of cellular connective-tissue elements and a consequent proportionate increase in the thickness, density, and inelasticity of the membrane. This process takes place just within and beneath the mucous membrane, and not on its free surface, as shown by A. Guerin,<sup>1</sup> who states that, in one hundred autopsies of patients with gonorrhœa, more than one-half of whom had stricture, he found the morbid process in these latter always to have acted immediately beneath the mucous membrane and in the spongy tissue. If the stricture is a little more extensive, a few whitish transverse fibres will be found encircling the canal, beneath the mucous membrane. If more advanced still, the meshes of the spongy tissue will be found glued together, obliterated, and a mass of dense, fibrous, callous material encircling the canal and holding it permanently contracted. This tissue may be slight in extent, cicatricial in character, tightly contracted, or it may be exuberant, knobbed, and excessive in amount, so that it may be readily felt from the outside of the canal, having a cartilaginous or even woody hardness. In this callous, fibrous mass, the microscope detects no yellow, elastic fibres (Thompson).

Flaps, valves, and free bands, adhesions, etc., are formed by atrophy of follicles, or of portions of submucous tissue; or the bands may be caused by the use of instruments in the canal—perforating a flap, for example.

CAUSE OF STRICTURE.—Omitting congenital and other varieties of stricture already alluded to (cancerous, etc.), organic stricture is always caused by inflammation or a traumatism. Inflammation of the urethra is the most common cause, whether this be simple urethritis or gonorrhœa; but the latter is far oftener followed by stricture, and that simply because the inflammation is more severe and more continued. Of two hundred and twenty cases of stricture studied critically by Thompson, one hundred and sixty-four (seventy-five per cent.) owed their origin to gonorrhœa. The longer the duration of a given gonorrhœa the more certain is it to be followed by stricture. This is almost surely the case where gonorrhœa prolongs itself indefinitely in the gleet stage, the latter condition being nearly conclusive proof of forming stricture. Gonorrhœa attended by chordee is more apt to be followed by stricture than are those cases where this complication does not exist. Should the chordee be "broken," stricture becomes inevitable, and that too of the traumatic sort. Any thing connected with urethral inflammation which indicates that the morbid process has extended outside of the mucous membrane, and has invaded the delicate meshes of the erectile tissue around the canal, warns us of coming stricture. The plastic exudation,

<sup>1</sup> *Loc. cit.*, p. 125.

as it is called, once effused, glues the meshes of erectile tissue permanently together, and the cell-proliferation, starting with the urethral inflammation, goes on after the latter has ceased, making new fibroid material, of which the tendency is steadily and more and more to contract. Cicatricial tissue manifests this tendency to contract and obliterate the canal, even more strongly than the tissue formed by cell-proliferation after inflammation. Linear longitudinal incisions do not occasion stricture. Whatever contraction occurs in them, when they unite without loss of substance, being in a longitudinal direction, would tend rather to increase than diminish the calibre of the tube; hence no stricture follows operations for stone (properly performed). Transverse incisions, on the other hand, are always followed by more or less stricture (Reybard).<sup>1</sup> If the incision only just open the canal, the amount of stricture will be inappreciable. If the urethra be partially severed, its upper wall being left intact, the contraction and subsequent stricture will be only partial, proportionately to the degree of section, and retention from such a stricture might never occur. When, however, the whole canal is divided across, then stricture, going on steadily to retention, is inevitable. Thus we may have a traumatic stricture giving scarcely any or indeed no symptom, and detected only by accident during a careful examination, although this is so rare as to be nearly hypothetical. For, even if only a portion of the floor of the urethra be cut across, yet the upper wall rarely escapes bruising, or injury of some sort, which may involve it in a chronic inflammation and overgrowth, causing it to assist in the formation of the stricture starting below. If the edges of a urethral wound slough from any cause, the subsequent stricture is by so much the more considerable.

Any injuries of the canal, involving loss of substance, produce stricture. To this class belong urethral chancres and ulcerations, gangrene from crushing or following phlegmonous erysipelas or infiltration, ulcers produced by prolonged pressure, stone, retained catheter, etc.

But classical traumatic stricture, such as it is the rule to encounter in practice, is formed most often low down in the canal (farther from the meatus than strictures produced by clap), involving the membranous urethra, and generally caused by a crushing injury to the perinæum. The urethra in this region is particularly exposed to contusions. It is fixed and cannot get out of the way, and the sharp edge of the sub-pubic ligament has a great deal to do in the causation of the injury.<sup>2</sup>

<sup>1</sup> "Traité pratique de Rétrécissements du Canal de l'Urètre." Argenteuil Prize, 1852.

<sup>2</sup> In January, 1866, assisted by Dr. Gouley, I endeavored to demonstrate, upon the urethra of the cadaver, the effect of blows inflicted upon the perinæum with a bluntish instrument. The subjects were placed upon the back, the legs moderately separated, and the blow administered by Dr. Gouley, standing over the cadaver, and using the broad base of a common axe. The effect of the blow was always found, upon subsequent dissection, to have expended itself upon the urethra, directly beneath the edge of the sub-pubic ligament. The injury inflicted varied with the force of the blow. The bulb was always contused, but, unless the force of the blow was considerable, the mucous

The injuries which have been reported as causing traumatic stricture in the perinæum, with or without a penetrating wound, are innumerable. Among the most classical may be mentioned falls from a height, the patient lighting astraddle a beam, a chair, a stump, a manger, the limb of a tree, the corner of any blunt object, a trunk, a box, etc.; falls astraddle a fence while walking upon it, of a wheel while mounting an omnibus, of the tongue of a wagon; falls upon a sharp object, as a chisel, the breakage of a chamber-pot upon which the patient has been sitting; falling with one leg through a hole in the ice, or down a coal-hole in the sidewalk; being thrown forward upon the pommel of a saddle, while riding; fracture of the pelvis, kicks in the perinæum from man, woman, child, or beast, etc., *ad infinitum*. This, perhaps, unnecessarily minute detail of injuries capable of causing stricture is given, because they are all occurring constantly. The authors have seen cases from each cause, and very many from some of them. They are very liable to be overlooked by the patient when, at the time, they do not give rise to hæmorrhage or retention. The injury is often slight, not causing much immediate disturbance, and the patient forgets it; he never has a gonorrhœa, perhaps, and yet in after-years symptoms of stricture come on, and the canal is found highly contracted at its membranous portion; or, in trying to relieve retention in fever, the physician finds his catheter unexpectedly arrested. In these cases, a strict inquiry into all antecedent injuries of the perinæum should be made, in order to get all the information possible upon the nature of the stricture.

Traumatic strictures are particularly liable to be sensitive, irritable, and resilient, and usually require harsher means of treatment than ordinary dilatation, and the employment of more persistent and intelligent measures to prevent recontraction afterward, than most strictures from other causes. Hence the imperative importance, in these cases, of insisting upon an intelligent use of the full-sized steel sound by the patient himself, for an indefinite period of time after cure—generally for the remainder of life; a task certainly irksome and disagreeable, but no more so, and no less necessary, than a truss to the ruptured, spectacles to the weak-sighted, an artificial leg to replace an amputated one, and certainly more necessary and less irksome than the daily use of the razor.

The only treatment of gonorrhœa which may cause stricture is the use of injections. The nozzle of a syringe, if long or roughly used against an inflamed mucous membrane, may irritate it sufficiently to keep up local inflammation, until it becomes chronic, and passes on to that cell-proliferation and thickening which constitute stricture. Linear strictures of the first half-inch from the meatus are doubtless often caused in this way. Secondly, too strong injections may cause stricture,

membrane of the membranous urethra escaped injury. Sometimes the membranous urethra beneath the sub-pubic ligament was partially lacerated, and sometimes totally severed; but this required a very forcible blow.—VAN BUREN.

usually situated from two to four inches down the canal, rarely lower. The rôle of injections in producing stricture has been doubtless over-rated; probably none of the fluids ordinarily used are able to occasion it, unless employed of very unusual strength. But, granting that gonorrhœa alone is amply sufficient to cause stricture, yet it is a singular coincidence, to use no stronger term, that most patients possessing particularly tight resilient stricture, not due to injury, but yet behaving as if they were traumatic, with a very sensitive, hyperæsthetic urethra in front of them—that most of these patients have used strong injections of the nitrate of silver, in attempted abortive treatment, or with the idea of “burning out” the disease—injections strong enough to bring blood freely, often to be followed by several hours of severe urethral pain. As a general rule, it may be stated that any injection strong enough to produce either of these two results (blood or subsequent prolonged pain) is capable also of originating organic stricture. The opinions of the profession, regarding the instrumentality of injections in causing stricture, have varied. Formerly it was believed that injections of all sorts produced stricture; but soon it was noticed that, although no injections were employed, still stricture continued to follow gonorrhœa. Then all rôle of causality was denied to injections, of whatever nature, and however used. But a pretty extensive experience seems to justify the placing of the truth between the two extremes, attributing the bad effects of the remedy only to its excessive strength, nitrate of silver being most often to blame.

#### TIME OF OCCURRENCE OF STRICTURE AFTER GONORRHOEA AND INJURY.

—Of the 164 cases of stricture following gonorrhœa, tabulated by Thompson, in 10, symptoms appeared immediately after or during the attack; 71, within one year; 41, between three and four years; 22, between seven and eight years; 20, between eight and twenty-five years. J. D. Hill,<sup>1</sup> from 140 cases of stricture from all causes, makes the length of the period, between the cause and the first symptoms of stricture noticed, to be: after gonorrhœa, shortest period two years; longest, thirteen years—after urethral chancre, shortest period ten months; longest, three years—after injury, shortest period four months; longest, eighteen months. The statement in the latter table of statistics, doubtless literally correct, tends to mislead. After a traumatism, of the crushing kind, to the perinæum, for instance, the classical course of events is as follows:

From œdema and effusion of blood, at first, there is more or less obstruction to the flow of urine; perhaps, if the canal is severed, there is retention. If the latter has not occurred, inflammation comes on, and the size of the stream is still further diminished. Now inflammation subsides and repair begins, and, with this repair, contraction goes hand-in-hand. Consequently, after a transverse or crushing wound of the

<sup>1</sup> “An Analysis of 140 Cases of Stricture of the Urethra,” London, 1871.

urethra, where repair begins stricture commences. It may not manifest itself by retention, or, indeed, by any symptom which the patient observes for four months or for several years, but it is there none the less.

If the injury has been slight, or the canal only partly involved, no appreciable symptom may occur for years (ten or twelve), as when boys have been kicked at school, have fallen on a fence, or been thrown upon the pommel of a saddle. The point of importance is this: traumatic stricture comes early because the violence causing it is greater (usually) than the violence of simple inflammation of the urethra. Let the violence be trifling, and the interval may be exceedingly long.

With this understanding, then, the deductions to be drawn from the above statistics are confirmed by daily observation: namely, that the symptoms of stricture appear earlier after a traumatism than after gonorrhœa, the date of their appearance measurably proportionate to the extent of the injury, and that the greatest divergence is noticeable after gonorrhœa. It is totally exceptional, however, for symptoms of organic stricture to come on "immediately after or during the attack" of gonorrhœa—as Thompson states occurred in ten of his cases—unless stricture existed previous to the attack, unnoticed by the patient, as sometimes undoubtedly occurs (*see Case X.*).

**IRRITABLE AND RESILIENT STRICTURE.**—A stricture is said to be irritable when it is sensitive, easily excited to inflammation from slight causes, rebellious to the use of instruments, fretting as it were under their employment. A resilient stricture (so named by Syme) is one which, without being necessarily irritable, is elastic, India-rubber-like, contracting quickly after being dilated, sometimes to an extent greater than existed before the use of the dilating instrument (*see Case XV.*). Traumatic strictures are sometimes of this type, as are strictures following strong injections of nitrate of silver.

## CHAPTER VI.

### STRICTURE OF THE URETHRA.

Instruments and their Use.—Filiform Bougies with Manceuvres alone, and as Guides.—Bougies.—Bulbous Bougies.—Catheters.—Sounds.—Scale.—Advantages of Steel Instruments.—Instruments for Divulsion with Manceuvres.—Instruments for Internal Urethrotomy with Manceuvres.—Perineal Urethrotomy with and without a Guide.—Rectal Puncture.—Supra-pubic Puncture.—Dieulafoy's Aspirator.

BEFORE passing to the diagnosis, symptoms, and treatment of stricture, it is better at once to describe the instruments to be used, the methods of manipulating them, and the operations in which they are employed, in order to avoid endless repetition.

Great mechanical ingenuity has been displayed in the construction

of instruments for the detection and treatment of stricture. Such of them will be mentioned as are considered best suited for these objects. Space will not allow a description of more than the type instruments of each class.

The instruments which it is necessary for the surgeon to possess in order to be able to meet the requirements of all cases of stricture are: different varieties of bougies, sounds, and catheters with a scale; instruments for divulsion, internal and external urethrotomy; trocars, canulæ, and an aspirator.

#### BOUGIES.

**FILIFORM OR HAIR-LIKE BOUGIES** are such as measure one millimetre or less in diameter—size No. 2 (one millimetre diameter) being the smallest size that can be accurately measured on a scale-plate. There are three varieties of filiform bougie: the French, English, and whalebone. They are all made conical, narrowing down to a fine point, and gradually increasing for an inch or two until the full size of the shaft is reached. The whalebones are olive-tipped.

**FRENCH FILIFORM BOUGIES** are of three varieties. They are black, and made of a gummy material spread smoothly over a woven frame. Some are entirely so composed, and in choosing these it is well to select the stiffest. Others are furnished centrally with a fine copper or lead wire running down to the point. These can be bent and twisted into spiral form at their extremity, to facilitate introduction, and avoid lacunæ and false passages; while in the third variety (Benas bougies) the central wire is replaced by a fine whalebone shaft to give it greater firmness.

Of these bougies, the first named, those without any central shaft, are often provided with a little metallic cap upon one end, furnished with a female screw, so arranged that it may be screwed upon the end of another instrument. By means of this ingenious device, when one of these bougies has been made to penetrate a stricture, and has reached the bladder, some other instrument which it is desirable to use for rupturing or incising the stricture, or drawing the urine, may be screwed into it and then pushed forward, following its guide through the stricture into the bladder. The filiform bougie coils up in the bladder, doing no harm there, and is withdrawn with the larger instrument. The device is due to Maisonneuve; it has been largely applied by others.

*Yellow English filiform bougies* are used in the same manner. Two cautions are necessary in regard to the employment of this species of urethral guide:

1. The little metallic cap upon the bougie should always be examined before it is used, to make sure that it is firmly attached to the bougie. They become loosened by time, and, if a defective instrument be used, there is danger of leaving the bougie behind in the bladder.