Hypospadias (*ὑπὸ, beneath; σπάζω, I divide*).—This deformity consists in an arrest of development of a portion of the lower wall of the urethra, its lateral halves failing to unite in the median line. The embryo at two months has hypospadias normally. The scrotum has not yet united, and, if natural evolution ceases here, the last degree of hypospadias results with bifid scrotum. Hypospadias may occur at any point in front of the membranous urethra, but does not involve the latter or the prostatic portion of the canal; consequently, no matter how extensive hypospadias may be, the patient has control over the escape of urine. When hypospadias is scrotal, the penis is usually very imperfectly developed, imperforate, and looks like a large clitoris. The bifid scrotum, kept reddened and moist by the urine where its two surfaces come into contact, passes very well for a vulva, and, in this way, some of the so-called hermaphrodites are formed, the true sex perhaps only being discovered after adult age has been reached—when the beard begins to grow, and the testicles to develop. The monstrosity known as hermaphrodite does exist, but is excessively rare. To constitute a true hermaphrodite, there must be penis and testicle, uterus and ovary.[1]

Hypospadias, anterior to the peno-scrotal angle, is more common than the scrotal variety, and most frequent of all is hypospadias confined to the glans penis or its immediate vicinity. That part of the urethra lying between a hypospadial opening and the meatus is usually absent or impervious, but may be patulous for a short distance in front of the opening in the floor of the urethra, or even up to the meatus. Hypospadias, as commonly encountered in practice, consists of an absence of the frænum preputii, and a flaring open of the meatus inferiorly, or an inferior opening in the canal within a few lines of the natural meatus, the position of which is usually marked more or less perfectly in its usual site. The glans penis may be bifid. The urethral orifice in hypospadias is small, as a rule.

The only disturbances caused by hypospadias are functional. The patient may not be able to pass water without wetting himself, as in scrotal hypospadias, and if the opening is too low in the canal he may be impotent, from inability to throw the semen against the uterine orifice.

Simple hypospadias rarely calls for surgical interference, and operations which have been performed for its relief are not over-encouraging in their results—that is, in regard to restoring large portions of the canal.

Hypospadias of the glans penis is unimportant; many patients possess it without being aware of the fact. It may be necessary to enlarge the opening in case of stricture of the urethra, in order to introduce instruments of sufficient size to accomplish thorough dilatation.

[1] Concerning hermaphrodism, may be consulted, with advantage, the extensive work of Isidore Geoffroy Saint-Hilaire, "Des Hermaphrodismes: Hist. gén. et prat. des Anomalies de l'Organisation," etc., 1836, vol. ii.; and Art. "Hermaphrodism," Nouveau Dict. de Méd. et de Chir. pratiques, 1873, vol. xvii., p. 488.

If a hole exists in the floor of the urethra, and the canal is found to be pervious in front of it up to, or nearly up to, the meatus, the case may be operated upon as if it were simple imperforation, and, after continuity of the canal has been established, the hole in the floor might be closed by a plastic operation (*see* Fistula).

Complications.—One complication of serious importance may occur with hypospadias, which always demands operation. It is where the corpus spongiosum and urethra are too short, so that, although the meatus urethræ may be found at or near the apex of the glans, still the short urethra acts like the string of a bow, and keeps the penis curved at all times, particularly during erection. The patient is usually retromingent. These cases are rare, but they have been operated on successfully.[1]

Each operation must be modified according to the amount of deformity. The indications are, to loosen the urethra and transplant its orifice sufficiently far back to keep it from exercising any traction when the penis is erect, and to incise the fibrous sheaths of the corpora cavernosa beneath transversely, and freely enough to allow the organ to be straightened; or even to divide the fibrous septum of the corpora cavernosa with a tenotome, if it also is contracted (as performed successfully by M. Buisson[2] for curvature of the penis). This point of "straightening the penis" is important. If it be neglected, although the urethra may be liberated, still the penis will remain curved during erection, because the sheaths of the corpora cavernosa are contracted and indistensible. The bleeding is very apt to be troublesome in this operation. Acupressure was of service in arresting it in Weir's case. Flaps may be taken from the sides of the scrotum to cover the under surface of the penis, from which the urethra has been taken away; and if, as in Weir's case, the patient desires to marry, an imperfect intromittent organ may be furnished him, which will put an end to his inability to cohabit, but not to his impotence.

Epispadias (*ἐπὶ, above; σπάζω, I separate*) is a fissure of the superior wall of the urethra with ectopia of the canal (Guyon). It is very rare. The urethral opening may be upon the glans, or anywhere along the top of the penis, as far back as its root. When the membranous and prostatic urethra are involved, there is also extrophy of the bladder. The orifice of the urethra in epispadias is large. Sometimes a finger may be passed through it into the bladder, that part of the urethra lying in front of the opening being an open gutter. Incontinence of urine is the rule, when the opening is far back.

There may be complete epispadias without extrophy of the bladder. Dolbeau[3] has published an autopsy of this condition, with plate. The

[1] One case by Dr. Weir, *New York Medical Journal*, March, 1874.
[2] Quoted by Guyon, *op. cit.*
[3] "De l'Épispadias, ou Fissure uréthrale supérieure, et de son Traitement," p. 46 Plate III. Paris, 1861.

penis is short and thick in epispadias, or small and more or less deviated. The pubic bones are usually, but not necessarily, separated in complete epispadias. In such cases there may be hernia of the bladder, without positive exstrophy.[1]

Epispadias is an arrest of development in the upper wall of the urethra, but it is still a matter of hypothesis how the urethra gets above the united corpora cavernosa; for, even when the genital buds, which are to form the corpora cavernosa, are still separate at the fortieth day of fœtal life, the urethra is beneath them. The fact, however, remains, as proved by Dolbeau's dissection, that the urethra gets above the corpora cavernosa, and fails to unite in its upper wall, the corpora cavernosa effecting their faulty union none the less. With exstrophy of the bladder, where the lower part of the abdominal wall is absent, and the pubic bones do not come together, it is easier to understand how the roof of the urethra may be wanting throughout.

Treatment.—Mature surgical judgment can promise little from operative procedure in epispadias. The adaptation of a proper urinal is the best treatment, either the model advised for exstrophy (Fig. 75), or the rubber urinal (Fig. 73). Operations which have been undertaken nearly always fail, erections and contact of urine, with smallness of the flaps, being the chief causes. The operations which have been most successful in covering over the canal are those of Nélaton and the modification by Dolbeau. They consist in freshening the edges of the flattened urethral furrow, and bringing down over it a quadrilateral flap of integument, which is adjusted, epithelium inward. The raw surface of this flap is in its turn covered by sliding flaps (epithelium outward), from the sides of the penis; or by dissecting up a flap from the scrotum, leaving it attached on both sides and running the penis under it, so as to bring the raw surfaces of both flaps into contact, separating the scrotal flap after firm union has been effected. Both of these operations have been successful in roofing in the canal, but the incontinence of urine has not been overcome.[2]

URETHRAL AND SEXUAL HYGIENE.

Before passing to the morbid conditions of the urethra, its hygiene in health and disease demands consideration.

That the urethra may be in a healthful state, able to get well if diseased, and then to remain well, two points must be observed. They comprise fully the hygiene of the canal. They are:

(1.) That the urine be non-irritating in character.

(2.) That sexual excitability be quieted.

[1] *Journ. de Méd., Chir. et Pharm.*, p. 14, 1841.

[2] For minute details of the operation, *see* Nélaton, "Traité de Pathologie externe" and Dolbeau. Thèse *cit.*

(1.) Urine, to be non-irritating, must be normal, faintly acid or neutral, free from sharp crystals, and not too concentrated. Hence measures tending to bring the fluid to this state are hygienic. These measures include general hygiene of the skin, stomach, muscles, lungs, etc., but also in many cases (especially where the subject is of gouty habit) certain dietetic precautions. The latter consist in the avoidance of all alcoholic fluids, especially sweet fermented wines and malt liquors. New ale is particularly harmful. All of these substances tend to create sharp crystals of uric acid in the urine, as well as to concentrate and acidify it. From this cause alone inflammation of the urethra may spring. Lemon-juice is also somewhat irritating to the urethra, as are, to a mild degree, all the condiments, salt, pepper, mustard, and, it is said, asparagus. In inflamed states of the canal, general hygiene prescribes rest.

(2.) The quieting of sexual excitability is an object not less important, but far more difficult to accomplish. No part of the body can be in perfect health unless its function is being regularly and satisfactorily performed. This is seen in stomach, brain, muscle, excretory duct. For example, when all the urine escapes from the urethra, through a large fistula in the perinæum, the fore part of the canal contracts and becomes hyperæsthetic.

The urethra, however, only performs the function of a sexual canal at longer or shorter intervals. If there were no erotic fancies, the urethra would never be called upon to participate in the sexual function, and the latter would have no influence over its health or disease. In the eunuch the hygiene of the urethra undoubtedly does not include the sexual problem.

If, then, the individual be absolutely pure in thought, word, and deed; if he never have nor have had an erotic fancy, direct or remote, then his urethra would be a urinary canal, and its hygiene would be simple. But absolute purity is not a common attribute of man, as any one who has the honesty to accept facts must allow, and the rule that every male adult has more or less strong sexual longings and necessities must be admitted. Hence is established the rule, borne out daily and hourly by an intelligent study of the parts concerned, both in health and disease, that the urethra is not in the best conditions for health unless the sexual needs are attended to. There is no possible means of accomplishing this result except marriage. Fornication is always irregular, unnatural, often excessive, and therefore is harmful and worse than nothing, looked at from a merely worldly point of view. Masturbation is degrading, and bears upon the whole well-being of the individual by ruining his *morale.* Nature's safety-valve, involuntary ejaculation during sleep, is inefficient. Marriage alone allows healthy, natural, unstimulated sexual relations, and alone accomplishes the first necessity of urethral hygiene—namely, sexual quietude. Hence the value of mar-

riage as a curative agent in morbid conditions of the urethra, especially if there be any nervous element in the case—an element which is almost invariably present in some degree.

In all conditions of acute inflammation, sexual intercourse must be, of course, absolutely interdicted. Excessive indulgence is bad at any time, but worst of all is stimulation without relief. This state is, unhappily, a common one among the unmarried men of large cities. Such individuals, looking at suggestive pictures, reading exciting books, taking part in impure conversation, become ripe subjects for nervous disease of an obscure sort, not only of the urethra but of the whole body. In fact, this undue stimulation, without appropriate relief, is far more often the cause of hypochondria, melancholy, and functional perversion, than is the masturbation to which the public generally ascribe it. Nor can such an individual, by any plan of fornication, escape the evil consequence to which stimulated but ungratified desire exposes him. Marriage with a pure woman may right him—rarely any thing short of this. Hence when such a case presents itself where marriage is impossible, or if the patient be already unhappily married, there is but one course left to advise, and that is absolute continence and an effort at purity of thought, with strict avoidance of all possible temptations to erotic thought or act, whether entering through the mind, the eye, or the ear—whether actual or implied, direct or remote. Could such a patient imitate the heroic example of St. Augustine—a record of which that honest father of the Church has left behind—he could control the hygiene of his urethra, and doubtless save himself much distress in life.

INJURIES OF THE URETHRA.

Injuries of the urethra, of seemingly an unimportant nature, often entail serious consequences. From the position of the canal, and particularly from the fact that it runs along the middle line of the perinæum, it is more exposed to injury than any other portion of the genito-urinary apparatus.

Contusion of the pendulous urethra is rare. If severe, it is followed by effusion of blood, hæmorrhage, inflammation, abscess, slough, and finally traumatic stricture—often by fistula, with loss of substance. Contusion of the deep urethra, on the other hand, is quite common. The sub-pubic ligament lies directly beneath the symphysis pubis, filling up the angle made by the junction of the two bones. This ligament is nearly as hard as bone, while its lower edge is thin and sharp. In all falls upon the perinæum, the urethra lies between this sharp edge and the body upon which the individual falls. The injury to the urethra is in proportion to the force of the blow upon the perinæum. The canal may be entirely cut across, or more or less crushed transversely. Injury by violence to the perinæum involves to a greater or less extent the membranous urethra and the bulb which partly overlies it. The immediate results are swelling, more or less escape of blood from the injured bulb into the surrounding tissues, often hæmorrhage from the urethral orifice; difficulty in emptying the bladder, perhaps amounting to absolute retention; possible infiltration of urine; perineal abscess and fistula; and finally traumatic stricture of the most obstinate character. Injury to the perinæum is not uncommon at any age from falling astride a fence, while walking on it, a wheel, while mounting a coach, etc. In boys a kick in the perinæum is often sufficient to damage the canal permanently, without apparently occasioning any immediate injury.

Treatment.—If the patient can pass water and there is no infiltration of urine, no attempt should be made to introduce an instrument into the bladder immediately after contusion of the urethra, for fear of making a false passage at the injured point of the canal. All means, local and general, must be used to keep down inflammation. If, however, there is retention, either immediate or secondary, from inflammation, and warm baths, local fomentations, and opiates do not relieve it, an attempt should be made to pass a soft, French olivary catheter very gently into the bladder. Failing in this, a long filiform whalebone bougie may be tried; and, if this pass, a soft catheter, open at both ends (Fig. 26), may be made to enter the bladder pushed along upon it as a guide. Should this manœuvre be ineffective, a Thompson's probe-pointed silver catheter (Fig. 33), gently manipulated, is pretty sure to find its way in. If the bladder cannot be readily reached, perineal section should be at once resorted to, as this remedies the retention, and is the best treatment for the traumatic stricture which will inevitably follow.

If a soft instrument can be introduced easily, it should be withdrawn after the bladder has been relieved, and reintroduced when necessary. If much difficulty is experienced in passing the catheter the first time, it should be tied in and left for a day or two, unless it causes the patient too much irritation, and then be withdrawn, cleaned, and reintroduced at intervals. As soon as the inflammation following the injury subsides, the passage of conical steel sounds must be commenced, increasing in size until the largest instrument is reached which the meatus will admit, and this must then be introduced by the patient himself weekly for a time, and then at appropriate intervals for an indefinite period, to prevent recontraction of the traumatic stricture.

If infiltration of urine has taken place, large, free, dependent incisions must be made in the scrotum and perinæum; to let out the urine and prevent sloughing, the scrotum must be elevated, and quinine and iron promptly commenced and followed up, to combat further complications. In this or any other condition of serious complication or difficulty, the soundest surgery demands the performance of perineal section at

once, inasmuch as this course not only provides for a free issue of urine (infiltrated or not), but puts the urethra under immediate control, and includes the proper means of avoiding traumatic stricture.

Wounds inflicted on the Urethra from without. — In children severe wounds in the perineal urethra may result from the breaking of the earthen vessel upon which they sit to empty the bowels and bladder. These may be followed by infiltration of urine with sloughing. Any part of the urethra is liable at any time of life to ordinary cutting injuries, inflicted by accident or design. Fracture of the pelvis, gunshot-wounds, etc., may damage the urethra very seriously. In a general way it may be stated that wounds of the urethra heal more readily in the perinæum than elsewhere (as illustrated by the median operation for stone), and are not apt, in this region, to be followed by fistula, unless there is some obstacle to the free escape of urine in front of the injury (stricture). Transverse wounds of any portion of the canal are followed by stricture (Reybard).[1] Longitudinal wounds, correctly coapted, are not. Wounds of the scrotum, extending into the urethra, are more liable than others to be followed by infiltration of urine, on account of the looseness of the connective tissue of the part.

Treatment of External Wounds.—Wounds involving the perineal urethra, if the canal be healthy (cuts made for stone), and the incision nearly longitudinal, may be left to granulate without interference. If, however, the wound is transverse, it should be dilated systematically while healing, as after perineal section for stricture. Where the pendulous urethra is wounded, the following course should be pursued: Unite the edges of the wound, at once and very accurately, with the finest silk suture. Draw off the urine from four to six times in the twenty-four hours. The catheter should be small, so as to disturb the process of repair as little as possible, and it should be employed often enough to keep the bladder from becoming distended. Should the bladder fill, a little urine is apt to be forced along the urethra outside the catheter, when the latter is introduced, and the object of using the instrument—to keep the wound from the contact of urine—to be frustrated.

When the surgeon cannot see his patient often enough to empty the bladder regularly, a catheter of pure caoutchouc, of medium size, should be first introduced into the bladder, the wound united over it, and the instrument left in, corked, to be opened every few hours. It should be retained until healing is complete. A Holt's self-retaining catheter may be used, or an ordinary vulcanized rubber instrument (retained as described in Chapter X., Fig. 67). Neither a metallic nor a hard woven instrument should ever be allowed to remain tied in the urethra, except in fracture of the penis. They are too irritating for the delicate membrane, liable to provoke ulceration at certain points, if long retained,

[1] "Traité pratique sur les Rétrécissements de l'Urèthre," Paris, 1858.

and should not be used if more suitable instruments are at hand. If the wound in the urethra fails to unite by first intention, the catheter should be withdrawn, and the fistula treated (*see* Fistula).

Wounds inflicted upon the Urethra from within are mainly such as are made by the surgeon in careless or rough manipulation (false passage), by divulsion of stricture, by internal urethrotomy, by lithotomy carelessly performed—especially in children where the urethra is cut or torn transversely—by the passage or rough extraction of stone fragments, the introduction of foreign bodies by the patient, etc. When such wounds occur, the urine comes in contact with the raw surface, and "urethral fever" is the common but not inevitable consequence. The more altered and decomposed the urine, the more liable is the patient to suffer.

URETHRAL OR URINARY FEVER.

The uncertainty which surrounds that condition known as urethral fever has not yet been entirely cleared up. The recent and able monograph of Girard,[1] the thesis of Malherbe,[2] and the paper of Banks,[3] presenting new cases, collating old and advancing new opinions, may be consulted with advantage.

The affection may assume either of four distinct types:

1. There may be a sharp chill, of longer or shorter duration, coming on anywhere within the first twenty-four hours (occasionally later), after manipulations upon the urethra or bladder, attended by an elevation of the temperature, and followed by fever (with perhaps delirium) and by sweat. After this there is no further trouble, or there may follow a number of days of general febrile excitement, *malaise*, inappetence, loss of strength, etc., and a slow recovery, or other paroxysms of chill and fever, with more or less complete intermissions, may ensue. This is the most common form.

2. There may be only a few slight rigors without much marked fever or any sweating—these passing off and leaving the patient as well as before.

3. There may be a distinct violent chill coming on rapidly, but of variable duration, attended by intense prostration, alarm, anxiety, and excitement at first, accompanied by violent vomiting, profuse diarrhœa, coldness, and lividity of the surface, almost total suppression of urine, all the evidences of uræmia, and a rapidly-fatal issue.

4. There may be slight chill and fever, followed by the (usually rapid) development of septicæmic symptoms and death, or, more slowly, by true pyæmia and death, the autopsy revealing abscesses in the prostate,

[1] "Résorption urineuse et Urémie dans les Maladies des Voies urinaires," Paris, 1873.
[2] "De la Fièvre dans les Maladies des Voies urinaires." Thèse, Paris, 1872.
[3] "Certain Rapidly-fatal Cases of Urethral Fever after Catheterism."—*Edinburgh Medical Journal*, 1871, p. 1074.

kidney, liver, lungs, suppuration in the joints (knee, shoulder), fluid in the pleuræ, pericardium, etc.

All cases can be arranged under these heads. The first two are by far the most common, and fortunately so, since they are the least disastrous.

That all these disorders should depend upon the simple absorption of urine through an abraded surface is in the highest degree improbable. Other forces are at work, and these are probably shock and reflex action, suspending the function of the kidneys, often already diseased. The condition of the urine also has much to do with the origin of urethral fever. It produces no effect in contact with a wounded surface, when it is normal, being sometimes used (in France) as a dressing to fresh wounds.[1] When in ammoniacal fermentation, it is undoubtedly capable, if absorbed, of occasioning septicæmic and pyæmic phenomena, and, unfortunately, in bladder and urethral disease, the urine is very often more or less decomposed.

The mystery about urethral fever is, why it does not occur more constantly, when the conditions are the same. The majority of patients escape, whether the urine is ammoniacal or not, whether the wound or the violence is great or small. The same patient may have a chill one day and escape it after an exactly similar operation on the next, or *vice versa*.

The simple gentle passage of a small soft bougie may give rise to it, while violent divulsion or urethrotomy, performed a day or two afterward, may produce no such result, and again after divulsion, which has been negative, the passage of a steel sound may produce a chill. Nor is it instrumentation alone which is the exciting cause, since patients, upon whom no instrument has ever been used, have well-marked exacerbations of chill and fever in connection with urethral and bladder disease, and these patients cease to have chills (which they usually call "dumb ague") after the use of instruments in their urethra has dilated the stricture. Other patients have no chill until dilatation has reached a certain limit, after which every effort to pass an instrument of a larger size is liable to be followed by urethral fever. The extent of the injury done is no index of the amount of fever that will follow. The gentle passage of a smooth sound may cause speedy death, while extensive wounds and lacerations of the canal are often absolutely innocuous, and that, too, where the urine is strongly alkaline.

The position of the injury inflicted by the instrument is of importance. At and near the meatus no amount of wounding seems capable of giving rise to chill, though decomposed urine pass freely over the raw surface. The danger increases in proportion to the depth at which

[1] Dr. Partridge, at my suggestion, injected sixty-minim doses of healthy urine into the subcutaneous tissue of the arm of many patients at the Charity Hospital, in 1873, never exciting suppuration.—*Keyes*. (*See*, also, note under EXTRAVASATION OF URINE).

the injury is seated. Nor does a wound seem to be necessary at all, since cases are on record where death, following rapidly upon the introduction of a smooth instrument, has failed to reveal by autopsy any lesion of the canal. Here shock and reflex action arresting kidney secretion would seem to be the immediate cause of death. The chill may come on before the instrument used has been withdrawn from the urethra (Case XVI.), but usually it does not follow for some hours, and generally not until after urine has flowed through the canal. In the rapidly-fatal cases, old and often advanced kidney-disease, or at least intense kidney hyperæmia, is found on autopsy; but in some cases these organs have been pronounced normal. Even in these latter there has usually been suppression of urine; but simple suppression of urine does not often kill in one or two days, and, to solve the problem in these cases, we are forced to fall back upon the effects of shock.

Treatment.—The treatment of urethral fever is mainly prophylactic. The object is to avert chill; for, after the latter has occurred, but little can be done to modify the paroxysm. After chill, morphine subcutaneously produces quiet, and seems to bring on the sweating stage more promptly; while, in uræmic conditions, every effort must be made by cups, baths, hot air, and cathartics, to stimulate the skin and intestine into action, and relieve the laboring kidneys.

The prophylactic treatment of urethral fever is simple. Operations performed under the influence of an anæsthetic are perhaps less liable to be followed by chill. Operations should be avoided if possible upon patients who are found to have structural kidney-disease; and, when surgical interference is unavoidable, particular attention must be paid to building up such patients, and exceeding gentleness employed in manipulating them. Where the urine is highly alkaline and decomposed, more trouble is to be anticipated than where the opposite condition obtains.

Among medicines, quinine probably holds the first place for its power of averting chill. The free and prolonged use of this remedy, before and during the treatment of urethral and bladder disease, seems positively to lessen mortality, and averts complications after operations, as proved by the testimony of almost all surgeons having the largest opportunities of observing this class of disorders. Yet quinine is not infallible, and will not always keep off (*see* Cases X., XI., and XII.) chill; but that it is useful in the great majority of cases there can be little doubt. In preparing for an operation, the patient may take five or ten grains night and morning for several days previously—and it is customary to administer ten grains with a quarter of a grain of morphine at the time of operation. Patients subject to mild repeated chills should be kept upon quinine constantly during the whole course of active treatment. Quiet and rest in bed, immediately before and for some hours after an operation upon the urethra, should also be

insisted upon in cases where trouble is anticipated; and, added to this, the relaxing influence of a warm bath is useful. The urine should also be rendered bland and dilute by the previous administration of demulcents with a mild alkali, such as the citrate of potash.

It is exceedingly doubtful whether any thing more than this can be done. Tying in a catheter will not avert chill, and is harmful in other respects. Drawing off the urine frequently through a catheter is usually impracticable, and of doubtful efficacy. Gouley[1] believes that he derives benefit (as a prophylactic) from ten-drop doses of the tincture of the sesquichloride of iron three times daily, and mentions favorably two-minim doses of Fleming's tincture of aconite, suggested by Long[2] as a preventive of chill.

A few cases to illustrate urethral fever will at once make evident the difficulties which surround its study. The profession is familiar with Thompson's case,[3] where a man with old, tight stricture died on the third day *after the passage of an instrument, which had been used upon him very many times before.* Vomiting with severe chill came on in an hour—immediate suppression and death followed. Autopsy failed to reveal any lesion of the urethra caused by the instrument. The kidneys were intensely congested and soft.

Among Velpeau's[4] cases—which have become classical—no kidney-lesions were found in several patients who died in this sudden manner; and hardly a year goes by that the medical journals do not furnish reports of further victims to urethral fever, some without, but the majority with kidney-disease.

Finally, the following three personal cases are selected out of a number as illustrating some of the uncertainties which surround the affection under consideration:

Case X.[5]—A gentleman of twenty-two, unmarried, strong, finely built, with powerful frame and vigorous constitution, came from the country, in 1871, for treatment for traumatic stricture, dating from a slight injury during boyhood—although the patient was not aware of this fact. Eight months previously, immediately after gonorrhœa (his first attack), he had retention. A surgeon to whom he applied broke one silver catheter in trying to force a passage through his tight stricture, but succeeded in reaching his bladder with a small instrument on another trial, after employing much force, drawing, the patient said, a pint of blood. The next day, according to the patient, severe "intermittent fever" came on, which lasted three months. Attempts were made at catheterism several times subsequently during the eight months, followed invariably by chill, fever, and sickness for two days. Sometimes chills came on when no instrument was used.

Examination detected a stricture in the deep urethra, which would only admit a filiform whalebone guide. A good many slight chills followed its introduction into the bladder. There was a great quantity of blood and pus in the urine, so that examination

[1] "Diseases of the Urinary Organs," 1873.
[2] *Liverpool Med.-Chir. Jour.*, January, 1858.
[3] "Stricture of the Urethra," third edition, London, p. 94.
[4] "Leçons orales d. Clin. Chir.," etc., Paris, 1841, p. 326.
[5] This case is detailed at length in the report of the Proceedings of the New York Pathological Society (*Medical Record*), 1873.

failed to establish the presence of any kidney-disease—of which there did not exist the remotest symptom. No preparatory treatment was employed, *no quinine taken;* but, on the fourth day, over a whalebone guide, Thompson's divulsor was passed through the stricture and screwed up to No. 20. (The meatus took No. 15 easily.) No chill nor the least unpleasant symptom of any sort followed. In a week the patient introduced No. 15 himself and left the city.

He continued perfectly well, passing his instrument occasionally for eighteen months, when he again acquired gonorrhœa, and had to give up the use of his sound for two months. On resuming its use he only succeeded in passing No. 12 with force, causing much pain. Cystitis ensued. He returned to New York, demanding another operation, which should be more radical than the first. Only No. 6 would pass. Cystitis was pretty well marked. Blood and pus abounded in the urine. There was no evidence of kidney-disease. *Fifteen grains a day, of quinine, were given to the patient for two days.* He was put to bed and kept quiet. Urethrotomy (internal) was performed, a cut not a line deep being made. But little blood flowed. No ether was given. Five grains of quinine were taken after the operation.

In half an hour severe chill, vomiting, and purging, came on; total suppression, and death in thirty hours, in spite of vigorous diaphoresis and catharsis, and a slight reëstablishment of the urinary flow.

Autopsy showed the right kidney somewhat atrophied, about two-thirds of the organ being the seat of parenchymatous nephritis. It was intensely congested. The left kidney was still further degenerated and more atrophied. There were several small abscesses in its walls; its pelvis was dilated. The left ureter was absolutely occluded, one inch from the bladder, so that no fluid could be squeezed through it. The occlusion was membranous and did not seem very recent, but there was no hydronephrosis, and the urine in the kidney was not decomposed. The walls of the bladder were immensely hypertrophied.

Remarks.—The bladder-walls were one inch thick, evidently due to long-standing stricture, which had existed from boyhood. The atrophy and degeneration of the kidney were so far advanced that it seemed probable that they had at least commenced when the first operation (divulsion) was performed; *yet this violent operation, which tore the floor of the urethra, and brought a quantity of blood, was the first time that an instrument had been used in the patient's urethra for a year without being followed by chill.* A filiform bougie, four days before, had produced numerous chills. On the other hand, the patient passes for himself, with violence, a No. 12—produces cystitis, but no serious symptoms. Finally, a small cut is made through the stricture, a small instrument only passed, and death follows in thirty hours, after severe chill and suppression.

Case XI.—Mr. ——, married, sixty-one years old—a weak, thin, white-headed, old man—came for cure of a stricture of over twenty years' duration, which had been dilated some years before, but allowed to recontract. His condition was one of retention, over-distention, overflow, atony; he constantly dribbled, night and day. A study of the case gave the impression that external urethrotomy would be unavoidable. Only the finest whalebone guide could be passed into the bladder, and that with the utmost care and patience. By careful and persistent effort the stricture was dilated up to No. 3 (soft bougie) in three weeks. The *first passage* of No. 3—in spite of three weeks of quinine—*gave the old man a tremendous chill*, coming on five hours afterward with vomiting, high fever, and prostration, which confined him to bed for ten days. There was partial suppression during the