STRICTURE OF THE URETHRA.

STRICTURE of the urethra has been defined commonly as an unnatural narrowing or constriction of some portion of the urethral canal. As the urethral walls are usually in apposition, and the urethra is a canal only when distended with fluids or instruments, stricture has been defined as a loss of dilatability of the urethra. These definitions include a number of conditions, which, for the sake of clearness, are given brief mention before beginning the consideration of the subject in hand—namely, true organic stricture.

The calibre of the urethra may be narrowed, even to the point of complete obstruction, by pressure from without of a periurethral abscess, cyst, or other tumor, or of an inflamed or hypertrophied prostate; or by the presence within the urethra of polypi or other growths; but in these conditions the narrowing is secondary to other diseases, and, to avoid confusion of terms, should not be called "stricture."

The swelling of the mucous membrane in acute inflammation of the urethra may diminish the size of the canal sufficiently to interfere greatly with the passage of urine, but this condition, unless complicating a preexisting organic stricture, or unless associated with prostatic disease or urethral spasm, is never sufficient to cause complete retention, and, moreover, is transitory. The term "inflammatory stricture," which has been

applied to this condition, is confusing and should be dropped.

Spasmodic stricture is a term applied to the spasmodic contraction of the urethral muscles that frequently occurs during instrumentation of the urethra, and which not uncommonly results from other local or reflex irritation or from psychical causes. In the majority of healthy urethras the passage of a bulbous bougie for the first time will induce a contraction of the urethal muscles sufficient to impede the progress of the instrument for a few seconds. Spasmodic contraction of the compressor urethræ and the "cut-off" muscles, or the failure to inhibit such contraction, makes it impossible for some men to urinate in the presence of others. In such a case the urethra and bladder may be entirely normal, and the cause of the failure is purely mental, for if the patient withdraw to a private closet, or if a catheter be passed beyond the contracted muscle, the urine flows freely.

While urethral spasm may thus occur in apparently healthy individuals with normal urethras, its production is usually due to some local or general pathological condition. Predisposing causes are found in a sensitive or irritable condition of the nervous system, in any disturbed mental state, in cachexia and debility, and in a rheumatic or gouty diathesis. It is easily provoked in the intemperate, and especially in those whose sexual hygiene is faulty. In some individuals there is a local hyperæsthesia of the urethral mucous membrane for which no sufficient cause is found, but in whom introduction of a sound always produces urethral spasm.

The exciting causes are found in any direct irritation, congestion, or inflammation of the urethra; in the reflex irritation due to disease of or operation upon any por-

tion of the genito-urinary tract, rectum, or anus; in irritation reflected from more distant parts of the body; and in psychical disturbances. The use of instruments in the urethra or operations upon any portion of it may be followed by spasm of the deep urethra and retention of urine. Such spasmodic stricture may persist for several days. A similar condition frequently accompanies the congestion of the deep urethra resulting from alcoholic or sexual excesses or from exposure to cold. Occasionally such congestion and spasm are produced by the internal use of cantharides, turpentine, and other drugs. Reflex spasm of the deep urethra may follow operations upon, or disease of, any portion of the genito-urinary tract, or may result from inflamed hemorrhoids and other sources of irritation in the rectum. It is reported to have followed operations upon more distant parts of the body, and to have been produced by a number of other causes, including strongly concentrated urine, malaria, neuralgia, abscess of the lumbar vertebra (Keyes), necrosis of the coccyx (Emmet), etc.

In most cases of urethral spasm, however, the cause lies in a congested or granular patch of mucous membrane or in an organic stricture situated in the bulbous or bulbo-membranous portion of the urethra. Spasmodic stricture may be produced by local disease in other portions of the urethra, if such lesions be irritated in any manner. The importance of a small meatus or of a stricture of large calibre in the anterior urethra as a cause of spasm of the deep urethra has unquestionably been over-estimated. Spasmodic stricture due to a congenitally narrow meatus or to strictures of large calibre in the anterior urethra, uncomplicated by inflammation or other pathological changes, is certainly very rare.

Spasmodic stricture, which is usually situated in the membranous urethra, is due to the contraction of the compressor urethræ and accelerator urinæ muscles and of the voluntary perineal muscles which make up the "cut-off" muscles of Cruveilhier; but it occurs in less pronounced form in the anterior urethra when the unstriped muscular fibres of the urethral wall contract about a foreign body—as an instrument—or about an irritated area of disease.

The spasm of the urethral muscles that occurs during the passage of a steel sound is usually readily overcome by pressing the tip of the sound quietly and steadily against the contracted muscles for a few seconds. At the beginning of the membranous urethra, especially in a nervous or sensitive man whose urethra is being explored for the first time, the contraction of the muscles may be so firm and persistent that firm and steady but gentle pressure of the point of the sound will be resisted for several minutes before relaxation occurs and the instrument can pass. In such a case the relaxation is often sudden and can be felt by the hand holding the sound, the tip of which passes the obstruction with a slight jumping or jerking movement. As a rule, the largest blunt steel sound that a urethra can easily accommodate will overcome spasm better than a smaller one, and will often succeed when bulbous sounds or finer rubber bougies fail to pass. Hence, in the first examination of any urethra large sounds should be used. By beginning with smaller instruments, and especially with a bulbous sound, a diagnosis of organic stricture may be made when there is present nothing more than urethral spasm, which is readily overcome by the large blunt sound.

In general, spasmodic stricture occurs suddenly and is paroxysmal, the stream of urine being normal in size except during the urethral spasm. If organic stricture is also present—and this is very frequently the case—its calibre will, of course, determine the usual size of the stream. Otis lays much stress upon the occasional occurrence of spasmodic stricture which may persist for years and in every way simulate organic stricture, even to resisting the passage of instruments in skilled hands. As every surgeon should make it a rule, before beginning a cutting operation on the deep urethra, to try to pass a sound when the patient is under an anæsthetic and the muscles are relaxed, these cases should always be recognized in time to prevent a needless operation. In the exceptional cases which simulate organic stricture in yielding only to gradual dilatation, careful watching will sooner or later reveal the true condition, while the removal of the cause of the spasm will be followed by the disappearance of the supposed stricture.

The treatment of spasmodic stricture lies in removing the cause when this can be discovered. Sexual and general hygiene and the general health of the patient should be properly regulated, a bland urine should be assured, and all sources of direct or reflex irritation, such as organic stricture and other lesions of the urethra or of other portions of the genito-urinary tract, should be removed. If retention occurs, it can usually be overcome by allowing the patient to recline in a hot bath until the muscles relax and the urine passes in the water. If this method fails, an opiate in full doses should be given, and, if necessary, a soft catheter may be passed after filling the urethra with warm oil; this operation is rendered easier if done while the patient reclines in the

bath. In extreme cases the production of full anæsthesia may be required to cause relaxation of the spasm.

Congenital stricture is rare and is limited to the meatus and the quarter of an inch of urethra immediately posterior to it. The size of the normal meatus varies greatly in different individuals, and it is impossible to name a standard below which a meatus should be considered abnormally small. Keyes says: "An individual with an average sized penis and urethra whose meatus will only take No. 10 (French) has stricture (congenital) of the meatus, although he may never suffer any inconvenience therefrom." The opening may be no larger than a pin-head, and yet may cause the individual no inconvenience. Such a condition is in reality a slight deformity, and calls for no treatment. It is better to limit the term "stricture" to narrowings that are associated with pathological changes or that interfere with the normal functions of the urethra.

If the normal urethra be distended to its greatest limit by means of the Otis urethrometer or of large bulbous bougies, in the large majority of cases the pendulous portion is found to be less distensible at some points than at others. These may be considered points of narrowing of the fully dilated urethra, but they are often inappropriately termed "strictures of large calibre," and as such are cut for the purpose of relieving deep urethral spasm and other functional genito-urinary disturbances for which the true causes are not apparent. These points of narrowing vary greatly in size, and are found chiefly within the first three inches from the meatus. As a result of many investigations both upon living and dead bodies, in which these points of contraction have been found in urethras otherwise

normal, the large majority of modern surgeons believe them to be physiological. They do not produce disturbances of the genito-urinary functions, and they do not interfere with the normal distention of the urethra during urination, or with the passage of ordinary sized instruments. Some practitioners are alone in working on the theory that the pendulous urethra should be a tube of uniform calibre—or, rather, of uniform distensibility—the diameter of which should bear a fixed relation to the circumference of the flaccid penis. Other parts of the body are not constructed on such mathematical principles, and in the face of evidence to the contrary it is difficult to see why the penis should be considered an exception.

In chronic urethritis these points of physiological narrowing in the pendulous urethra, as well as narrowings of the urethra due to chronic congestion and infiltration of smaller or larger areas of the mucous membrane and the submucous tissues, have been subjects of much dispute. Some practitioners call such narrowings "strictures of large calibre," and operate upon them for the sole purpose of relieving the urethral discharge. The majority of surgeons, however, do not consider such narrowings strictures, but treat them as cases of chronic urethritis. There are undoubtedly cases in which the question becomes a relative one, for the majority of strictures are preceded by chronic urethritis, with congestion, infiltration, and thickening of portions of the mucous membrane and the submucous tissues. Just when the formation of connective tissue begins in such areas, and just when contraction of such tissue is sufficient to interfere with the normal calibre of the urethra, are often difficult questions to decide. It is best to class these narrowings with stricture only when there is periurethral or submucous deposit which has begun to contract and to diminish the lumen of the canal, producing a distinct contraction, or when symptoms of stricture (frequency of urination, dribbling of urine at the close of the act, gleet, etc.) are present. In a doubtful case, and especially if the point of narrowing is covered by an inflamed and thickened mucous membrane, it is better to postpone a diagnosis of stricture until the proper treatment for chronic urethritis—preferably the steel sound—has been given a faithful trial.

The question as to what constitutes the normal calibre of any given urethra is considered more fully in the section on diagnosis, but, as a rule, if the penis be of average size and the urethra allows a No. 22 to 26 (French) steel sound to pass easily, the presence of stricture may be excluded. Practitioners who find and cut numerous "strictures of large calibre" in the pendulous urethra claim that, though these narrowings be normal, in chronic urethritis they tend to increase the friction of urine and the irritation and inflammation at these points, and therefore to favor a deposit of plastic material and the ultimate formation of a true stricture. It is undoubtedly true that such a result follows in a small number of cases, and that it could be prevented by early cutting, followed by the use of the sound; but, on the other hand, it should be remembered that most of these cases recover under treatment (with the steel sound) given for chronic urethritis, and that cutting operations on the urethra, even in the most skilful hands, are attended by a mortality of from 2 to 5 per cent.