Stricture rarely reaches this stage, however, without producing cystitis and other results and complications of stricture; these secondary disorders present their own characteristic symptoms and may result fatally. Among the chief complications and results of stricture are inflammatory and other disorders of the bladder, ureters, and kidneys; urinary calculus; epididymitis; prostatitis; perineal abscess; urinary extravasation and fistula; hemorrhoids (from pressure on the veins during straining efforts to empty the bladder); and disturbance or obliteration of the sexual functions.

Mental disturbance, as in other diseases of the genito-urinary organs, is often extreme and difficult to overcome. Sexual hypochondriacs who are suffering from ill-defined pains and sensations or from other functional disturbances due to faulty sexual hygiene not infrequently imagine themselves the subjects of stricture, and are often reluctant to accept any other explanation of their sensations or fancied disorder.

Fistula and extravasation are immediate results of severe forms of stricture. When ulceration occurs in some portion of the urethra—usually one of the sacculi or distended follicles—back of a stricture, and a few drops of urine escape into the surrounding tissues, abscess follows. Such an abscess may open again into the urethra and produce an internal blind fistula; but it usually opens externally, and, retaining its connection with the urethra, produces urinary fistula. A blind internal fistula may persist as such for some time, and may be felt as a hard lump in the periurethral tissue, but it usually inflames and fills with pus, which eventually finds an external outlet. Instead of forming a single fistula, pus in the periurethral tissues may burrow slowly in several

directions and discharge through a number of external openings in the perineum, scrotum, body of the penis, thighs, groins, or nates. Civiale reported such a case in which the urine afterward escaped through fifty-two external openings. Usually, however, one fistula forms at a time and serves as an outlet for the urine. The walls of such a fistula are soft at first, but, influenced by contact with urine, they gradually undergo changes similar to those in stricture-formation, become hard and callous, and contract until the channel becomes too small to allow the escape of urine. A new abscess forms, and terminates in a new fistula which pursues a career similar to the one preceding, and the process may thus be continued indefinitely. Instead of opening on the surface, a fistula may find an exit in the rectum.

If a sufficient portion of the urethral mucous membrane back of a stricture is destroyed or gives way at one time to allow a large quantity of urine to escape into the surrounding tissues, extravasation of urine follows. This unusual and serious complication of stricture is described by Keyes as follows:

"In infiltration the urine may take any one of five directions:

"1. It may, when small in quantity, get out of the urethra, but not penetrate Buck's fascia, in which case it may long remain confined to one spot in the perineum as a hard rounded swelling, like the blind internal fistula already described.

"2. It may find its way rapidly through the meshes of the corpus spongiosum, and cause gangrene of that body, with sloughing of the glans penis, preceded by coldness and the appearance of a black spot upon the glans.

"3. It may burrow inside of Buck's fascia, but outside of the corpus spongiosum, forming a fistula opening behind the glans penis near its root, a hard ridge marking the course of the fistula within Buck's fascia.

"4. It may escape behind the triangular ligament into the cavity of the pelvis.

"5. It may escape outside of the common fascia of the penis, in front of the triangular ligament, in which case it rapidly distends the perineum, the scrotum, and the connective subcutaneous tissue of the penis, and mounts up over the abdomen, and may also, more rarely, perforate the deeper layer of the superficial perineal fascia, and descend upon the thighs.

"When extensive infiltration of this sort occurs, all the parts affected becomes œdematous; gases form in the connective tissue, causing emphysema and making the tissues crackle when pressed by the finger. Dark spots soon appear, indicating gangrene, and extensive portions of tissue may slough unless relief be promptly afforded.

"The constitutional symptoms are those of shock. A chill usually occurs, followed by great depression, a cold clammy skin, feeble, quick, irregular pulse, hurried respiration, furred tongue, complete anorexia, symptoms of septicæmia, and death.

"When urine escapes behind the triangular ligament —which it does more rarely—it infiltrates deeply around the prostate and rectum well back in the perineum, around the bladder and up behind the pubes, forming abscesses in the cellular tissue of the hypogastrium, or perhaps deep pelvic abscesses."

Keyes reports his own experiments and quotes those of Mengel to show that normal urine injected in small

quantities into healthy tissues is absorbed without injuring them, and believes that if urine is evacuated by operation as soon as it has extravasated, serious gangrene may often be averted. If the urine be decomposed before its escape, as is often the case, or if infectious matter from the urethra be carried into the tissues with the urine, gangrene is certain to follow.

In very rare instances some portion of the bladder, instead of the urethra, may rupture. This accident is followed by an extravasation of urine that almost invariably terminates fatally.

Fistula and extravasation occur only in old and neglected cases of stricture, and are almost never found outside of dispensary and hospital practice.

Instrumentation of the Urethra.

Before attempting the use of instruments in the urethra, the student should become thoroughly familiar with the anatomy of the urethra and the perineum and with the landmarks of these regions. The following characteristics of the urethra should also be borne in mind:

The meatus, as a rule, is the narrowest point in a normal urethra, while the membranous portion is nearly as narrow. In addition to these two points of decided narrowing in the urethra, the pendulous portion may contain one or more points of slight constriction, usually situated in the second or third inch from the meatus, which points are recognized only when the urethra is fully dilated. The urethra also contains three decided enlargements. The first is the fossa navicularis, in the roof of which, about half an inch from the meatus, is a mucous flap forming the lacuna magna, which often