If limited to the anus, the disease should be treated simply with cleansing and astringent lotions and powders, and the surfaces should be separated with soft dressings, the principles and details of treatment being essentially those recommended for balanitis. Excoriations, fissures, and superficial fistulæ may be touched with solutions (or the solid stick) of nitrate of silver. If the disease extends into the rectum, care should be taken to secure a regular daily evacuation from the bowel, and the rectum should be irrigated thoroughly once or twice daily with a warm saturated solution of boric acid. For this purpose the rectal irrigator devised by Dr. James P. Tuttle is desirable. It may be necessary to dilate the sphincters and to apply a solution of nitrate of silver to excoriations and superficial ulcers that may be present.

Gonorrhœal inflammation of the mucous membrane of the mouth has been reported in very few instances, the largest number of cases being in new-born infants undoubtedly infected during birth by vaginal discharges. The symptoms are those of a severe stomatitis. The diagnosis is made from the history and by the finding of gonococci in the discharge. In new-born children the disease appears much earlier than do other forms of stomatitis. The treatment consists in frequent washing of the mouth with warm saturated solutions of boric acid (the addition of slippery elm or of flaxseed to the solution is sometimes very grateful), and in the application to the surface of astringent solutions. Nitrate of silver in strength varied to meet the indications of each case is the best preparation.

Gonorrhœal inflammation of the nose has been mentioned by several writers, but an unquestionable case has not been reported.

CHRONIC URETHRITIS.

Synonyms.—Chronic gonorrhœa; Gleet.

Before terminating in complete recovery every case of acute urethritis passes through a subacute stage with a muco-purulent and finally a mucous discharge. Following a first attack of gonorrhœa, in a healthy man under favorable hygienic surroundings, this muco-purulent stage tends to recovery without local treatment; but when following repeated infections, or an infection in an unhealthy individual or in one subjected to improper treatment or other injurious influences, this subacute stage may be prolonged indefinitely, and is known as "chronic urethritis" or "gleet."

Etiology.—In the cachectic, chronic urethritis may occur independently of an acute attack; but almost all cases originate in gonorrhœa.

The influences which interfere with the proper recovery of gonorrhœa and which tend to prolong the disease in chronic form are numerous and vary widely in different individuals. The general health of the patient is an important factor. In gouty, rheumatic, strumous, syphilitic, tubercular, anæmic, or debilitated persons it is not unusual for gonorrhœa to be followed by chronic urethritis. It occurs frequently as a result of repeated infections, or after a first infection in which there have been a series of relapses.

Probably the chief factors in the production of chronic urethritis lie in the failure of the patient to observe a proper sexual hygiene during and after an attack of gonorrhœa; and the most persistent and intractable cases are found in men who, in spite of their disease, are indulging in promiscuous sexual relations, or who are subjecting themselves to other forms of sexual excitement, or who, in their efforts to get well, are constantly irritating the urethra by improper or excessive treatment. Mention has already been made of the fact that the cessation of a urethral discharge does not necessarily mean that the urethra has returned to a normal condition. It is difficult to make the average patient understand this fact, and realize the necessity of his living hygienically for some weeks or months after his gonorrhœa is apparently cured. Offenders of one class resume sexual relations as soon as the discharge becomes invisible. Such men often incur fresh infection, and have within a few months a series of gonorrhœas some one of which will surely terminate in the chronic form; or, if fortunate enough to escape fresh gonorrhœal infection, nevertheless the recently inflamed mucous membrane of the urethra becomes the seat of small areas of chronic congestion and infiltration, resulting in a gleety discharge. Others, without sexual intercourse, indulge in sexual excitement, physical or mental, which aggravates the congestion of the parts and does not permit the rest necessary for a complete recovery.

Alcohol and tobacco are irritants to the mucous membrane of the urethra, and if used during the course of gonorrhœa or urethritis tend to prolong the disease. The resumption of their use too soon after the apparent cure of an inflammation of the urethra is many times responsible for a return of the discharge; while many subacute cases refuse to get well until the patient abandons his habits in this particular. Similar in effect to the use of alcohol and tobacco, though in lesser degree, are excesses in eating, especially of nitrogenous and highly seasoned foods. Imperfect digestion, followed by incomplete assimilation and metabolism, necessitates the elimination through the urine of products foreign to normal urine, and therefore irritating to the urethral mucous membrane. Imperfect functional activity of the skin and the bowels, by adding to the quantity of solids in the urine, and therefore to its irritating qualities, may retard the recovery of a urethritis. Excessive physical exercise, while not so harmful as in acute urethritis, sometimes exerts a deleterious influence upon a chronic discharge.

A frequent source of chronic urethritis lies in excessive and ill-advised treatment, the patient trying one injection after another, using sounds, soluble bougies, and other forms of local and internal treatment, in hopes of removing the last trace of his discharge. These cases are most frequently found in unmarried men who are greatly worried about themselves and who drift from one physician to another. They try the "infallible" prescriptions recommended by their friends, and in the course of their wanderings they sooner or later fall into the hands of charlatans, and submit to all sorts of operations and treatment. If properly advised in time, before operative procedures have damaged the tissues, many of these cases recover completely as a result of simply suspending all treatment and living hygienically.

When the mucous or muco-purulent stage has lasted for some weeks, or when there has been a series of relapses, the disease usually becomes localized. The

greater portion of the urethral mucous membrane recovers its normal condition, but certain circumscribed areas become the seat of chronic congestion and infiltration, or some of the complications which have arisen become persistent. The causes of this localization lie largely in the anatomical structure of the different parts of the genito-urinary tract. The inflammatory process naturally becomes more firmly seated in those portions well supplied with follicles, glands, and vessels. For this reason the prostatic, if once infected, and bulbous portions of the urethra and the fossa navicularis are especially liable to the persistent forms of inflammation and congestion. In most cases of chronic urethritis some portion of the anterior urethra is involved.

Among the local conditions which may exert an unfavorable influence upon chronic urethritis or be responsible for its persistence are areas of congestion and infiltration in the urethra, stricture, hypertrophy of the prostate, prostatitis, vesiculitis, lacunal inflammation, Cowperitis, folliculitis, periurethral abscess, fistulæ with internal openings, mucous patches in the urethra, and local tuberculosis.

The rôle of the gonococcus in the etiology of chronic urethritis is not yet definitely determined. These microorganisms can be demonstrated in many cases, but they are present in small numbers, and often can be found only after repeated examinations; while in quite a percentage of cases repeated careful examinations fail to show the gonococci. It would seem that the pathological processes instituted by the gonococcus may continue after the disappearance of the latter.

Symptoms.—The symptoms of chronic urethritis vary with the individual, the duration of the disease, and its

location. In recent cases and in those undergoing active local treatment there is usually, in addition to the circumscribed pathological process, more or less congestion and catarrhal condition of the mucous membrane of the entire urethra, resulting in a mucous discharge which may be sufficient to stain the linen, or, if the prepuce be long, to keep its inner surface and that of the glans constantly moist; or there may be a subacute inflammation with a muco-purulent discharge.

In old cases in which most of the urethral mucous membrane is healthy and the disease is confined to one or more small areas, two or three drops of mucus or of mucopus collect in the urethra during the night and are seen at the meatus by the patient on rising in the morning. During the day, when the urethra is washed out more frequently by the passage of urine, the collection is usually only sufficient to cause slight moisture of the lips of the meatus or to slightly glue them together; or there may be no evidence of discharge during the day, and but an occasional agglutination of the lips of the meatus in the morning; or, finally, there may be no symptoms noticeable by the patient while he is living a regular life, though sexual indulgence or the use of alcohol or tobacco, or even excesses in eating or in exercising, may cause a prompt return of the discharge. These relapses are frequently considered new, mild infections, but they differ from the latter in that the symptoms appear at once, without any period of incubation, and subside in a few days under simple treatment. Sometimes the only evidence of disease is that found in the urine, which may be clouded with pus and mucus from the posterior urethra, or may be clear except for shreds composed of mucus, epithelium, and pus-cells.

Subjective sensations are often entirely wanting, though the condition may persist for months or years. More frequently the patient experiences, while urinating, slight burning, pricking, or tingling sensations along the urethra or at the site of the lesions. In disease of the posterior urethra there may be a feeling of warmth, fulness or weight in the perineum, with possibly some increased frequency of urination, or even slight tenesmus; and if, as frequently happens, the inflammation invades the glands and the tissues of the prostate, there may be added all the distressing symptoms, both physical and mental, of chronic prostatitis.

If the process extends beneath the mucous membrane of the urethra, stricture may follow, with all its symptoms. If one or more follicles or glands of the urethra or the periurethral tissues are involved, the symptoms will depend upon the activity of the inflammation in these structures.

Pathology.—Regarding the pathology of chronic urethritis, Finger, who has made a histological study of a large number of cases, arrives at the following conclusions:

"1. Chronic urethritis is a focal process which runs its course as a chronic hyperplasia in the subepithelial connective tissue. Disease of the epithelium and glands is to be regarded in part as a complication, in part as a sequel.

"2. The foci of chronic blennorrhœa are localized preferably in the pendulous portion, the bulb, and the prostatic portion.

"3. The membranous portion is relatively immune to the chronic process.

"4. In a series of cases the foci of chronic inflammation in the pars anterior and posterior are situated superficially in the mucous and subepithelial connective tissue.

"5. In another series of cases these foci extend by continuity to the submucous tissue—in the pars anterior, to the periurethral and cavernous spongy tissue; in the pars posterior, to the prostate.

"6. This results in complicating focal processes—chronic periurethritis in the pars anterior, prostatitis in the pars posterior.

"Hence arises the following classification of chronic urethritis:

"I. Chronic anterior urethritis: (*a*) Superficial anterior chronic urethritis; (*b*) deep anterior chronic urethritis (that is, plus chronic periurethritis).

"II. Chronic posterior urethritis: (*a*) Superficial chronic posterior urethritis; (*b*) deep chronic posterior urethritis (that is, plus chronic prostatitis).

"As a matter of course, mixed forms are frequent—that is, various foci in the pars anterior and posterior.

"The relation of gonococci to chronic urethritis is extremely obscure. . . . Their virulence is weakened by long proliferation upon the same soil for many generations. As proof may be cited the fact that chronic blennorrhœa is often conveyed as chronic, much more rarely as acute, blennorrhœa. The fact that each succeeding relapse is milder and shorter also indicates that the irritation of the papillary body by the gonococci gradually diminishes. The first relapses will always terminate by the removal of the gonococci to the surface, but the virulence may finally be diminished to such an extent that the acute purulent symptoms on renewed invasion of the papillary body no longer suffice to carry the gonococci to the surface. They will then remain in

the papillary body, perhaps also in the follicles, and by their constant slight irritation give rise to the chronic proliferating processes in the mucous membrane. The conveyance of these enfeebled gonococci would explain the *ab initio* chronic infection in women; and their proliferation in the deep layers enables us to understand the fact that gonococci may or may not be found in the secretion, the clap-shreds. But the chronic changes induced by the gonococci may develop further after the cocci have perished from any cause. This explains the fact that in certain chronic blennorrhœas we find the secretion and clap-shreds, but no gonococci."

Diagnosis.—The symptoms of chronic urethritis are usually so evident that a diagnosis of urethritis is readily made. The difficulty lies in determining the seat and nature of the pathological process. The diagnosis between an exacerbation of a chronic urethritis and a recent mild infection is not difficult when it is remembered that the former appears in a few hours after exposure, without any period of incubation, is generally attended by no symptoms other than a trifling discharge, subsides readily under mild treatment, and has been preceded by other similar relapses of more or less recent date.

Chronic prostatitis may exist independently of urethritis, and may present symptoms identical with those of the same disorder when it complicates posterior urethritis. The diagnosis will depend upon the history and the absence of other evidences of urethral disease.

The adhesion of the lips of the meatus or the appearance of an occasional drop of mucus does not necessarily indicate urethritis. These symptoms may appear as a result of hypersecretion of mucus by a congested urethra. This condition is found in patients who are irritating the mucus membrane of the urethra with needless injections or instrumentation. It is also found in persons who commit sexual excesses, natural or unnatural, or who indulge in ungratified sexual excitement. Under these circumstances the congestion and hypersecretion of mucus which always attend an erection become more or less persistent. Under the microscope such a discharge is seen to be composed of mucus and epithelial elements. The absence, on repeated examinations, of pus-cells and gonococci excludes urethritis.

The Infectiousness of Chronic Gonorrhœa.—The discovery of characteristic gonococci in the secretion or shreds from the urethra at once determines the case to be one of chronic gonorrhœa. But in the majority of cases of chronic urethritis demonstration of the gonococci is not easy, since they are usually present in small numbers and associated with other micro-organisms. In a given case drops of pus and shreds may be examined for a number of days without discovering the gonococci, which a few days later may be found in considerable numbers. Negative findings are not conclusive, and so long as the secretion contains pus, the presence of gonococci should be suspected and sought for. In exacerbations of chronic urethritis the gonococci increase in numbers and can more readily be demonstrated; hence it may be justifiable, when repeated examinations give negative results, to cause an artificial inflammation of the urethra for the purposes of diagnosis. In anterior urethritis this object can be accomplished by irrigating[1] the pars anterior a few times with a solution of bichloride in strength of 1 : 20,000 or 1 : 10,000. In posterior urethritis a few drops of a 1 per cent. solution of nitrate of

[1] See *Irrigation* (index).

silver may be placed in the deep urethra with a Keyes syringe. The increased (purulent) secretion which results will usually show gonococci if these be present. There are cases of urethritis in which artificial exacerbation of the disease and repeated examinations of the secretion fail to demonstrate the gonococci. The secretion in such cases is rarely anything more than mucus, and is the product of a catarrhal process in an overstimulated mucous membrane.

It is evident that with a chronic urethritis in the secretion of which gonococci are present but occasionally, a man may indulge in sexual intercourse repeatedly without infecting his partner, though he has no means of knowing at what time his discharge may become infectious. It is not safe, therefore, to allow a man with chronic urethritis to marry, or, if married, to resume marital intercourse, until during several weeks of frequent examinations the discharge shows no gonococci and the clinical symptoms point strongly to the presence of nothing more than a catarrhal discharge.

On this subject Finger says: "I permit a patient who is suffering from chronic blennorrhœa—that is, the morning drop or clap-shreds—to have marital intercourse only after I have convinced myself, by a two to four weeks' daily examination of the secretion or clap-shreds, that these contain only epithelium, and no pus-cells, and when, after irrigation of the urethra with a solution of silver nitrate or corrosive sublimate, and consequent suppuration, the secretion is entirely free from gonococci, and there is no further indication for the continuance of treatment. The conditions which I require are, accordingly, the absence of gonococci, pus-corpuscles, and periurethral complications."

Noeggerath believes that if a man once have a urethral discharge containing gonococci, he never fully recovers, and that nine-tenths of the women married to men who have had gonorrhœa eventually develop pelvic inflammation due to infection by the gonococci. Such inflammations are usually subacute in their origin, and often date from the birth of the first child. On the other hand, Keyes, in his treatise of 1888, says: "Care must be exercised in advising marriage, if the discharge be at all purulent and contain gonococci. No such pus can be pronounced free from contagious properties, although, practically, in my experience it has sometimes turned out to be so. In all cases of prolonged purulent gleet a lesion in the urethra (strictures, granulations) should be sought for and treated. If not found, and if no gonococci are present, marriage is proper, and not only not harmful, but even beneficial, in its effect upon the discharge."

Localization of Lesions.—In all cases of chronic urethritis it is necessary to determine the extent, location, and nature of the pathological process. In the majority of cases this is limited to small circumscribed areas, but in more recent cases, and in those giving a history of frequent relapses or continued local treatment, the entire mucous membrane may be the seat of a subacute inflammation, or at least of a chronic congestion. When a large portion of the urethra is thus involved, there will be a more abundant secretion, and the urine containing the washings of the urethra will be cloudy from the presence of pus or of mucus. Examination with instruments for the local lesion should be postponed until the more general disturbance has been removed by proper treatment.

The first step in locating the seat of a chronic urethritis is to determine if it be in the anterior or the posterior urethra.

1. *History and Symptoms.*—If there be a history of epididymitis, prostatitis, cystitis, vesiculitis, tenesmus, or other symptoms pointing to a former acute posterior urethritis, it is quite probable that in the posterior urethra will be found the lesion responsible for the chronic disorder. Subjective sensations are usually insignificant or wanting in chronic urethritis of the pars anterior, but if the pars posterior be involved there are usually ill-defined sensations and pains in the perineal region, and sensitiveness of this portion of the urethra on pressure upon the perineum or through the rectum; there may be frequency of urination, tenesmus, and other symptoms pointing to the presence of chronic prostatitis.

2. *The Discharge.*—If the discharge arises from some portion of the pendulous urethra, it will gravitate to the meatus, and appear there occasionally as a yellowish, milky, or transparent drop, or it may lightly glue together the lips of the meatus. When the process is situated in the bulb, the discharge, if small in amount, may remain *in situ* until washed out by the urine. Discharges arising from the pars posterior will not appear at the meatus during the intervals of urination, but will remain in the prostatic portion or will pass backward into the bladder.

3. *Examination of Urine.*—When the pathological process has become limited to circumscribed areas, neither pus nor mucus will accumulate sufficiently to appear as a discharge or to render the urine cloudy, but the urine may contain flakes or shreds composed

of mucus, pus, and epithelium. The shreds may be transparent, delicate, narrow threads, often very long and branched. These threads are composed chiefly of mucus and epithelium, show a tendency to float in the urine, and in general indicate superficial and milder lesions of the urethra. Other shreds are shorter, firmer, and opaque, and contain a greater number of pus-cells. Such shreds sink rapidly to the bottom and indicate a more serious condition. A third type of shreds is sometimes found in the form of short, firm, comma-like plugs or flocculi. These particles come from the excretory ducts of the various glands and follicles of the urethra that may be involved in the process. The character of the shreds gives some clue to the nature and intensity of the urethral disorder, but does not give reliable information regarding the location of the lesion. If, however, the shreds contain spermatozoa, or if they are of the comma-like variety and are present in the second portion of the urine, they come from the prostatic urethra.

The urine should be examined by the two-glass method, though this test is of less value than in acute urethritis, since the small amount of pus formed in the posterior urethra will be removed in the act of urinating before sufficient has accumulated to pass back into the bladder, and during the day, while the urine is passed at frequent intervals, that in the second glass will be clear and free from shreds. But if the urine be retained several hours until the prostatic urethra is well dilated, forming practically a part of the bladder, the pus and the shreds will mix with the urine in the bladder and appear in the second glass. Hence it is important that the patient bring his morning urine passed in two bottles,

and that he again urinate in two glasses at the time of his visit to the physician. Another condition may be present, even when the urine in the bladder is clear, to cause cloudiness and shreds in the second glass: if the prostatic glands are inflamed, pus and comma-like plugs may be pressed out by the contraction of the muscle at the close of urination, appearing with, or just after, the last drops of urine.

The two-glass test may be modified by first cleansing (*irrigating*) the anterior urethra with some simple aseptic or mildly antiseptic solution. A 6 per cent. solution of sodium chloride, or bichloride of mercury in the strength of 1 : 50,000, or boric acid, may be used. The reservoir holding the fluid should be but two or three feet above the level of the penis, and should be connected, by means of rubber tubing, with a short glass or hard-rubber tube. The latter may be inserted into the urethra about an inch, and should not be large enough in diameter to completely fill the meatus, since space must be left by the side of the tube for the solution to escape. The fluid may then be allowed to flow until the pars anterior has been entirely cleansed of all pus, mucus, and shreds. If the patient now urinate in two glasses, the first glass will contain the washings of only the pars posterior; consequently, if the urine in both glasses be clear, it is evident that the disease is limited to the pars anterior; but if the urine in the first glass contain pus or shreds, while that in the second glass is clear, it is safe to make a diagnosis of posterior urethritis. If the urine in both glasses contain pus and mucus, inflammation of the bladder or of the kidneys is probably present. In this case other examinations should be made, and especially of urine that has been

retained in the bladder but a short time. If the second glass at any time shows clear urine, cystitis may be excluded.

The reservoir should not be placed at too great an elevation, and the lips of the meatus should not be held against the tube to interfere with the free outflow, or the pressure upon the compressor urethræ muscle will be sufficient to cause it to relax, and the fluid will pass on into the bladder, carrying with it pus and shreds from the pars anterior. The object of the test will thus be defeated, since the urine in the bladder—and therefore that in both glasses—will contain the washings of the

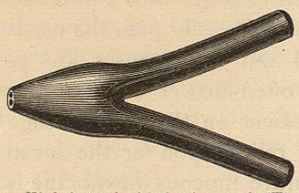

FIG. 17.—Kiefer's urethral irrigation nozzle (Tiemann).

pars anterior. A Keifer nozzle (Fig. 17) or a double recurrent catheter may be used, but is not essential. Instead of the short tube a soft catheter may be employed. The tip should be introduced no further than the bulb of the urethra.

A simpler method of locating the origin of shreds in the urine is found in completely filling the anterior urethra by means of a gonorrhœal syringe with a solution of methylene-blue or other stain. This solution is left in the urethra for one or two minutes and is then allowed to escape. The patient should now urinate in two glasses. The first portion of urine may thus contain shreds from all parts of the urethra, but