of the acute stages, and, moreover, shortens the duration of the disease. Finger states that he believes copaiba taken internally acts in the urine as a parasiticide, destroying some of the gonococci. The action of copaiba (and allied drugs, such as sandalwood and cubebs) is undoubtedly local, and is due either to the drug itself or to the products of its metamorphosis present in the urine as it passes over the mucous membrane of the urethra. This fact was demonstrated by Ricord and Roquette in patients with urethral fistulæ who acquired gonorrhœa. While taking copaiba internally the portion of the urethra, back of the fistula, that was washed by the urine showed marked improvement, while no change was apparent in the part anterior to the fistula, and through which no urine passed. The patient continuing the internal use of the balsam, some of his urine was injected into this anterior portion of his urethra, the result being a lessening of the inflammation.

In examining the urine of a patient who is taking copaiba it must be remembered that the mineral acids produce with it a flocculent precipitate which can easily be mistaken for albumin. This precipitate is soluble in an excess of acid or in alcohol. Copaiba is best given in the form of the balsam, either in capsules of 10 minims each or in one of the following preparations:

℞. Balsam. copaibæ, ℥ss–ij;
Syr. tolutani, ℥j–ij;
Acaciæ pulvis,
Sacchar. albi, *āā.* q. s. ad ft. emuls.
Lavand. spirit., ℥j;
Aquæ destill., q.s. ad ℥vj.—M.
Ft. emulsio.
Sig. Teaspoonful dose.

℞. Potassæ citratis, ʒij–vj;
Balsam. copaibæ, ʒiij–vj;
Extr. fl. hyoscyami, ʒss–ʒij;
Syr. acaciæ, ℥iss;
Aquæ menth. pip., q. s. ad ℥iij.—M.
Sig. Shake. Teaspoonful in water.

The last preparation is recommended by Keyes, who adds that "The mixture may be largely modified by substituting sandalwood oil for copaiba, leaving out the hyoscyamus when not required, substituting bicarbonate of soda for the citrate of potash if the diuretic effect is not desired, and wintergreen-water for mint-water, or even adding licorice, according to taste." Oil of sandalwood or oil of cubebs may be added to either of the above emulsions if desired.

The remarks made with reference to copaiba apply in the main to the *oil of sandalwood.* The latter is, however, more easily digested and does not produce an exanthem, though it may cause congestion of the kidneys with resulting characteristic pains in the back and the loins. In a majority of cases, owing to the uncertainty of obtaining the pure drug, less uniform results are obtained from the oil of sandalwood than from copaiba; but while it is not so efficacious in subduing the painful symptoms of the acute stages, it often seems more effective in reducing a subacute discharge. It should be tried in the acute stages instead of copaiba when the latter is not tolerated. It is best given in capsules each of 10 minims; or it may be dropped on lump-sugar, in which case an ounce of sandalwood oil may be flavored by adding to it 10 or 15 drops of the oil of wintergreen or the oil of peppermint; or it may be substituted for

copaiba in either of the emulsions for which formulas have been given.

Preparations of cubebs are, as a rule, too stimulating to be given while the inflammatory symptoms are at all marked. They are of great service in checking the last drops of a lingering discharge, either at the close of an acute case or in subacute and chronic cases. They usually cause no disturbance in digestion, and they frequently act as tonics to the stomach. The best preparation, if fresh, is the powder. It should be given in doses of from 10 grains to 2 drachms. When desired by the patient, it may be given in capsules or be administered in some syrupy or mucilaginous drink. The oleoresin in 10-minim capsules, from one to three at a dose, is perhaps as good as the powder; while the fluid extract in from 10-minim to drachm doses often gives good results. In stubborn cases of subacute and torpid type it is advisable to make occasional changes in the preparations given. Good results are often obtained from a combination of cubebs and sandalwood, with the addition sometimes of copaiba.

In prescribing any one or all of these preparations several rules should be observed. A dose on retiring for the night should be given, in addition to that after each meal, thus keeping the urine constantly under the influence of the drug. The doses should be small at first, particularly in the early stages, and should gradually be increased up to the full tolerance of the patient's stomach, or until the desired effect is produced; for if this can be accomplished in smaller, it will, of course, be worse than useless to give larger doses. If, after a week or two of full doses, no benefit has been derived from the drug (provided always that the patient has had proper hygienic

management and surroundings), or if the patient's stomach begin to rebel, a change to one of the other preparations should be made. No one of these remedies, particularly copaiba, should be given continually through too long a period. If, at the end of one, two, three, or four weeks, symptoms of gastric disturbance begin to appear, or if, in the case of sandalwood, there are indications of congestion of the kidneys, such as pain, or a sense of burning and oppression in the loins, another drug should at once be substituted.

Treatment of Successive Stages of Gonorrhœa.—Attention to all the details of hygienic management are of the greatest importance in all the stages of gonorrhœa, and have been fully discussed in the preceding pages.

(*a*) *Prodromal Stage.*—It is not often that the physician has a chance to observe this stage of the disease, which usually lasts but a day or two, and passes unnoticed by the average man unless he is watching himself in fear of the possible result of a suspicious intercourse. If there is a clear history of exposure followed by a period of incubation, and certainly if there can be expressed a drop of mucus in which there are a few gonococci, gonorrhœa will undoubtedly follow, and the patient should be put under hygienic treatment at once, with the addition of an alkali internally. If circumstances point rather to the presence of a non-infectious urethritis, the same treatment will do no harm, though it may not be necessary to interfere to the same extent with the patient's habits of living, removal of the cause if discovered, the administration of an alkali, and rest being in the majority of cases all the treatment that is necessary. The general condition of the patient may call for consideration.

(*b*) *Increasing Stage.*—During this stage the patient with a well-managed case of gonorrhœa usually finds his chief source of anxiety in the urethral discharge, and looks upon its daily increasing amount with much apprehension. It is then that the physician is tempted to satisfy his patient by using methods that will promptly check the discharge, and in this course there may be danger. Often, by too vigorous local treatment the modification of the discharge is followed by complications so painful and distressing that the sufferer would gladly welcome a return to the discharge if he could be relieved from his new and serious symptoms. The treatment in this stage should therefore be directed more to the alleviation and, if possible, prevention of painful symptoms and complications, and to the general condition of the individual, than to the suppression of the discharge.

The pain and burning on urinating—*ardor urinæ*—should be controlled, if possible, by drinking large quantities of fluid to dilute the urine, and, as already described, by the use of alkalies. This object will nearly or wholly be accomplished when the urine is kept alkaline. Some preparation of copaiba or of sandalwood may then be given in small doses. In cases where the pain is very great, much relief is afforded by immersing the penis in hot water during the act of urinating. If these means are found in any case to be impracticable, the fluid extract of hyoscyamus may be given with the alkali several times a day, in doses of from 1 to 5 minims. The injection of a weak solution of cocaine just before urinating is recommended by some authors, but its use does not to any great extent lessen the amount of pain, and it must be remembered that deaths have been reported from the use of cocaine in the urethra.

In cases of complete *retention* or where the urine will pass in drops only, a good plan is to place the patient in a hot-water bath—a sitz-bath will answer—and allow him to stay there quietly for a few minutes, an hour if necessary, until the urine passes. This is a most effectual means of emptying the bladder without distress to the patient, and it usually enables him to urinate with much less difficulty the next time the act is attempted. Occasionally this procedure will not suffice, and a catheter must be used; this should be soft and small, in size about No. 12 or 14 of the French scale, and should be introduced with great care, after first injecting the urethra with warm olive oil, that its inflamed membrane may be damaged as little as possible. The operation is made still easier if, in addition to the above precautions, the catheter is passed while the patient reclines in the bath. A careless use of the catheter will damage the mucous membrane, add to its swollen condition, and therefore increase the urethral obstruction. If other means fail, ice in the rectum may be tried. It should be pulverized and put in a suitably shaped flannel bag. Finally, aspiration may be necessary. Complete retention is, however, unusual, unless the patient before acquiring his gonorrhœa had a stricture.

The treatment of *chordee* and other forms of sexual irritation attending gonorrhœa must be chiefly hygienic, and has already been considered, the requirements being absence of all sexual excitement, a light diet, regular daily evacuation of the bowels, sleeping in a cool room on a hard mattress without too much covering, and the immersion of the penis for a few seconds in hot water or for a longer period in cold water, just before retiring, to be repeated during the night if necessary to reduce pain-

ful erections. If the patient is in the habit of sleeping on his back, he may lessen the congestion of the genitals by lying on his side. He can force himself to do this by tying a towel about his waist with the knot resting on his spine. If all these details are faithfully carried out, it is rare that camphor, belladonna, lupulin, bromide of potassium, and other so-called "anaphrodisiacs" will be needed, or, if tried, will be found beneficial. They are all unsatisfactory, and frequently disturb the functions of other organs of the body. Lupulin is probably the best of the list, and bromide of potassium the next, but to produce more than a moral effect they must be given in large doses.

The treatment of the complications that may occur during these and the succeeding stages of gonorrhœa is considered elsewhere.

(*c*) *Stationary Stage.*—When the inflammation has reached its acme it tends to persist unchanged for about a week or even longer. The treatment is that of the preceding stage, except that at this time the amount of copaiba or of sandalwood taken may be increased. Four doses a day should be ingested, beginning with about 10 minims of the balsam of copaiba, or, if this is not well borne, 10 minims of the oil of sandalwood, and the dose should gradually but steadily be increased until the symptoms improve or until the stomach will tolerate no more. Few can digest at a dose more than 20 or 30 minims of either of these preparations. When such quantities have been given for a week without producing favorable results, it is wise to change or to try a combination of the two; or, if the discharge continue and the inflammatory symptoms be not high, some preparation of cubebs may be added. Local treatment is not yet indicated.

(*d*) *Stage of Decline.*—If the discharge rapidly subsides, it is not wise to tax the stomach too severely with copaiba or sandalwood, for fear of having to suspend their use altogether; but if one of them has not already been pushed to the limit, now is the time to do so. As the discharge diminishes in amount and becomes less purulent and more mucous in character the copaiba may be dropped, and sandalwood oil or cubebs, or both, be substituted. If under this treatment the discharge entirely ceases, the remedy in use at the time should be continued for another ten days, gradually decreasing the quantity until at the end of the time the patient may be taking only a small dose at night. All medication may now be stopped, and if at the end of another two weeks there is no discharge or other symptoms, and the drop of mucus squeezed from the deep urethra on several successive days show no gonococci, the patient may be allowed to return gradually to his accustomed habits of living. He must, however, be cautious in beginning the use of alcohol and tobacco, and for the unmarried sexual intercourse promises an added danger for some time to come, while the married must be careful not to indulge to excess.

Injections.—The stage of decline is that which is most frequently prolonged, and if the discharge does not continue to diminish under hygienic management and internal treatment, injections may be used to advantage. Many habitually begin their use at the outset of this stage, but, as a rule, it is better to postpone the use of an injection until other treatment proves insufficient. While symptoms of inflammation persist, injections must be used, if at all, with the greatest caution, the strength of the liquid used being always in inverse proportion to the acuteness of the symptoms, otherwise there is danger of

producing an exacerbation of the existing trouble. Better a slow but steady disappearance of the discharge than a series of relapses from too energetic treatment. Injections and other forms of local treatment should always be reserved as a last resort for a patient who has had a posterior urethritis, an epididymitis, a prostatitis, or a cystitis complicating his gonorrhœa at any time during its course. The appearance of one of these complications during such treatment calls for its immediate suspension.

Injections are used to greatest advantage when the discharge has been reduced to a thin muco-pus, or possibly to a few drops of mucus that appear only in the morning, but which refuse to disappear under other treatment. They are also indicated in cases of urethritis, of whatever origin, which run a subacute course and which do not respond to internal treatment and proper hygienic management. These statements do not sanction the use of an injection in every case in which the lips of the meatus are adherent in the morning, or its prolonged use in cases where a morning drop or two at the meatus will not disappear after an injection has been used for a fortnight, or in cases which are not being otherwise properly managed. Frequently one injection after another is tried, the treatment being persevered in for weeks with the hope of removing the last traces of a discharge. It is well to remember that in these cases the local treatment may keep up the irritation, and that many patients recover as the result of merely stopping the injections.

To inject the urethra properly calls for the right kind of a syringe and some skill, easily acquired by the majority, on the part of the patient. The syringe should hold from 2 to 4 drachms, though the urethra usually will hold less than two. The piston should fit tightly, to permit

no leaking, but at the same time should move freely and easily within the barrel, and should have a ring at the end to receive the index finger. The nozzle should be a blunt cone, so that the tip, which should be perfectly smooth, will barely enter the meatus, and will not project into the urethra to irritate or damage the mucous membrane (Fig. 16). The syringe having a barrel of

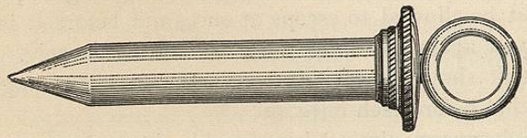

FIG. 16.—Urethral syringe.

hard rubber with a soft-rubber tip fulfils these requirements admirably. It is perhaps needless to add that the syringe should be scrupulously clean.

To inject successfully, the patient should encircle the penis, just back of the corona, with the thumb and the forefinger of the left hand, exerting no more pressure than is necessary to enable him to extend the organ to its full length as the fluid is forced in. The syringe should be held in the right hand, with the tip of the index finger in the ring at the end of the piston, while the barrel is firmly held between the other three fingers and the thumb. With the penis gently drawn out to its full length, and with the tip of the syringe pressing into the meatus with just sufficient firmness to prevent leakage, the fluid is slowly and steadily forced in until a slight ballooning or a feeling of fulness and tension in the urethra informs the patient that the urethra will hold no more. As the syringe is withdrawn the lips of the meatus are gently held together, retaining the medicament in the

urethra for about a minute before allowing it to escape. The whole procedure should be gentle; any forcing of the fluid back of the compressor urethræ muscle into the deep urethra and the bladder is to be avoided. Slight pressure upon the piston is not dangerous, and no more is necessary. Injections may be used once, twice, or even three times a day, the last on retiring for the night; but, should an injection cause much burning or pain, it must be allowed to escape at once, and before it is employed again the fluid must be diluted largely. The patient should always first urinate, thus cleansing the urethra before each injection.

Substances almost innumerable have been recommended and employed for urethral injections, but the skilful physician will select a few, usually not more than two or three, and learn to use them well. He becomes thoroughly familiar with their effects upon the varying stages and conditions of urethral inflammation, and accomplishes better and more definite results if he uses these few remedies, in varying strength and frequency of application, than if he resort to others excellent in themselves, but with which he is less familiar. The following are among the best:

℞. Liq. plumbi subacetatis dil., ℥j;
Morphiæ acetatis, gr. j.—M.

This formula is recommended by Keyes for use in lesser stages of inflammation. In subacute cases the following are good:

℞. Potassii permanganat., gr. ss–j;
Aq. destill., ℥j.—M.

Or,

℞. Zinci sulphat., gr. j–ij;
Aq. destill., ℥j.—M.

Or,

℞. Acid. tannic., gr. ij–vj;
Aq. destill., ℥j.—M.

In ordering an injection it is well to advise at first a dilution with two or three times its bulk of water; if this be ineffectual, and yet produce no irritation, the strength may gradually be increased. On the contrary, no injection should be continued which causes more than a slight smarting sensation while in the urethra and possibly for a few minutes afterward. The idea of "cauterizing" the urethra or "burning out" the disease has long since been abandoned. Injections are further considered in connection with the treatment of *Chronic Urethritis.*

Summary of Treatment in Stages.—(*a*) *Prodromal Stage.*—Hygiene; alkali; guarded prognosis.

(*b*) *Increasing Stage.*—Hygiene; proper local dressing; proper use of local hot and cold baths; alkalies; balsam of copaiba if well digested; if not, sandalwood oil, the dose of either being from 5 to 10 minims four times a day.

(*c*) *Stationary Stage.*—Same as preceding, except that the dose of copaiba should steadily be increased to the point of improvement in symptoms or until the stomach begins to show signs of rebellion. If copaiba be not tolerated or be ineffectual, sandalwood oil is employed; if both are well digested, but when given singly are ineffectual, they are to be combined. When the inflammatory symptoms are mild, some preparation of cubebs may be added or substituted.

(*d*) *Stage of Decline.*—Same as preceding, except that as the discharge subsides copaiba is abandoned and sandalwood oil and cubeb preparations are substituted. If under this treatment the discharge persists in a subacute form, injections are indicated. Mild solutions are at first employed; later, if necessary, the solutions may be increased in strength.

The practitioner should never forget his patient while treating his patient's urethra. A feeble or cachectic subject should not have a restricted diet that may still further reduce his strength and vitality. A man with a weak stomach should not swallow medicaments that induce marked digestive disturbances. No physician should persist in directing his efforts solely to the urethral discharge when the general condition of the patient calls for tonic or specific treatment. Sometimes a subacute urethritis in a feeble or cachectic individual refuses to subside under treatment ordinarily indicated in a urethritis of the same grade and character, but improves rapidly and disappears after the administration of iron, quinine, strychnine, cod-liver oil, or malt, together with fresh air and sunshine—in short, under such treatment as is called for by the general condition.

Prognosis.—That gonorrhœa does not often directly threaten life is true; but that it is as harmless as many young men, and even not a few inexperienced physicians, believe is far from true. Cases have occurred in which, as the result of poor hygienic surroundings or bad treatment, a high grade of inflammation has been followed by gangrene, septic infection, and death. Much more frequently death follows some of the complications of gonorrhœa, such as a prostatitis with prostatic or periprostatic abcess; peritonitis following inflammation of

the seminal vesicles; epididymitis; cystitis; pyelonephritis; or, more remotely, gonorrhœal rheumatism, endocarditis, or pericarditis. While the immediate danger to life is not so great, there is great danger that there will be left some form of chronic urethritis, stricture, chronic prostatitis, cystitis, vesiculitis, an ankylosed knee-joint, or an indurated epididymis which will render the affected testicle incapable of performing its function: if both epididymes have been involved, the man may for ever be denied the privilege of having children of his own. Or there may result some of the so-called "functional" and "nervous" disturbances of the genito-urinary system which so frequently undermine the tone of the entire nervous system, resulting in neurasthenia, hypochondriasis, and kindred obscure disturbances.

The first attack of gonorrhœa, under proper management and in a healthy man, has a tendency to run a definite course toward recovery. It is quite unusual, however, for a patient with gonorrhœa to be so situated that all his surroundings are favorable to his complete recovery. Such a situation is difficult to obtain for any but those who for some other reason are compelled to remain in bed during the course of the disease; and, as each successive attack exhibits a greater tendency to become chronic or to leave some portion of the urethra permanently damaged, the consequence is that but few urethras once infected with gonorrhœa ever return fully to their normal condition. Noeggerath believes that a man never fully recovers from his first gonorrhœa, and claims that nine-tenths of all women married to men who have ever had gonorrhœa eventually become sufferers from some form of pelvic inflammation. This is an extreme view, and one not yet fully accepted. The

question is further considered in connection with the subject of prognosis in *Chronic Urethritis.*

The duration of a gonorrhœa under proper treatment depends so much upon the individual, his habits, his surroundings, and the previous state of his urethra, that it is impossible to make definite statements applicable to all cases. The prognosis must always be guarded. Usually the first attack of gonorrhœa, under favorable circumstances and with good treatment, lasts from five to eight weeks. The discharge may disappear or be suppressed by local treatment much earlier, but this fact by no means proves that the urethra is in a healthy condition or that slight irritation may not induce a discharge showing gonococci in abundance and proving highly infectious. Successive attacks, though less acute, are generally of longer duration. In general, an attack following a short period of incubation, in which the symptoms rapidly reach a climax of intensity, terminates in recovery earlier than another with a longer period of incubation in which the symptoms are subacute.

COMPLICATIONS OF URETHRITIS.

ACUTE POSTERIOR URETHRITIS.

THE term "acute posterior urethritis" is applied to inflammation of the membranous and prostatic portions of the urethra. The compressor urethræ muscle forms the dividing-line between the two anatomical divisions of the urethra, known as the anterior and posterior (or deep) urethra, or the pars anterior and the pars posterior. The pars anterior includes the bulbous and pendulous portions of the urethra; the pars posterior, the membranous and prostatic portions. The division is of importance from a pathological point of view, because of the close anatomical relations between the posterior urethra and the epididymis, prostate, bladder, and seminal vesicles. Inflammation of any of these organs is liable to occur with or after posterior urethritis, and when one of them is implicated the presence of posterior urethritis may be taken for granted.

Etiology.—A posterior urethritis may appear any time after the third week of gonorrhœa, or before the third week in cases subjected to improper local treatment or which have not had proper hygienic management, or in cachectic and debilitated individuals. At any time during the course of gonorrhœa the extension of the inflammation to the pars posterior is favored by any mode of living or treatment that tends to congest or irritate this portion of the urethra. As a result of