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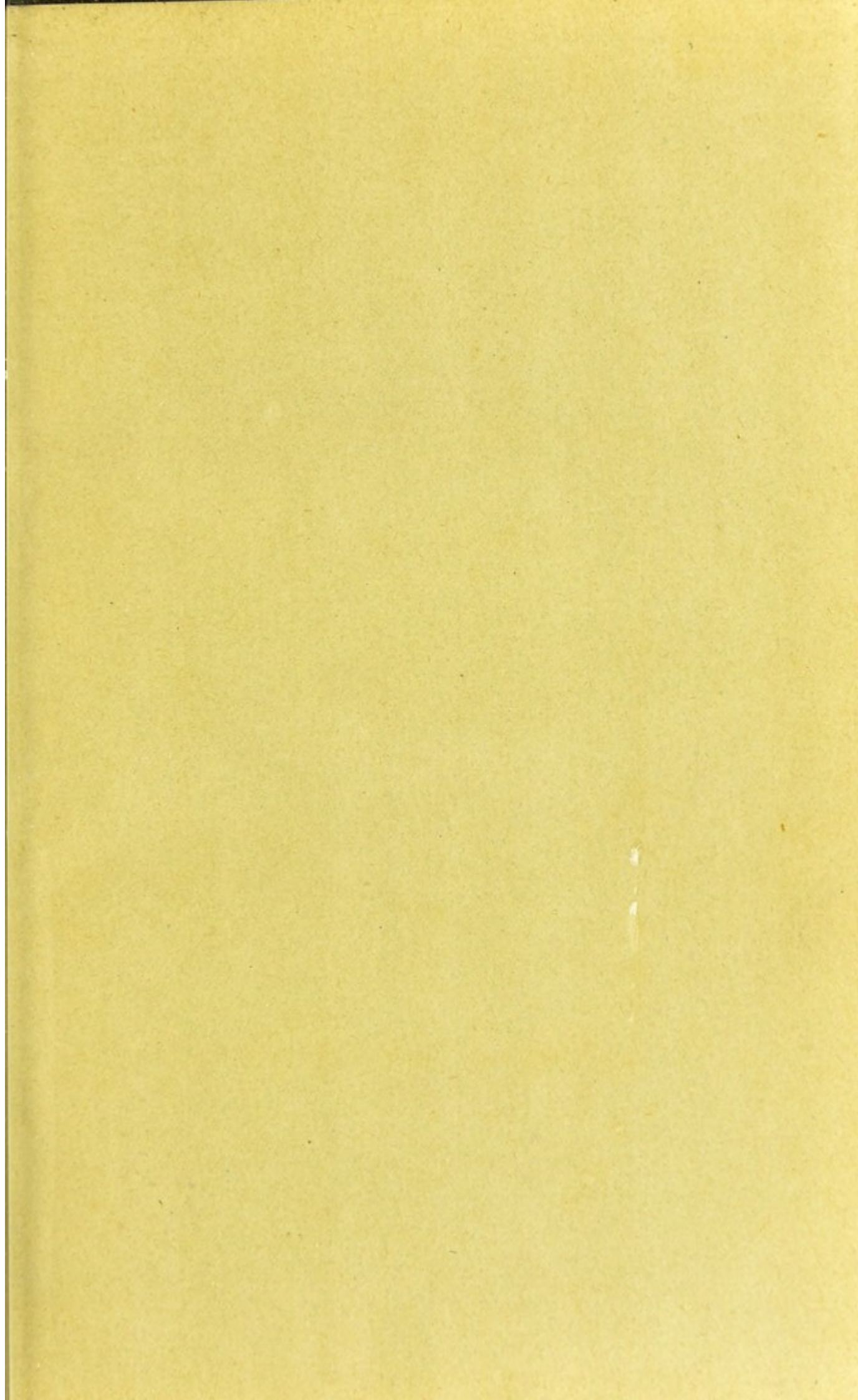
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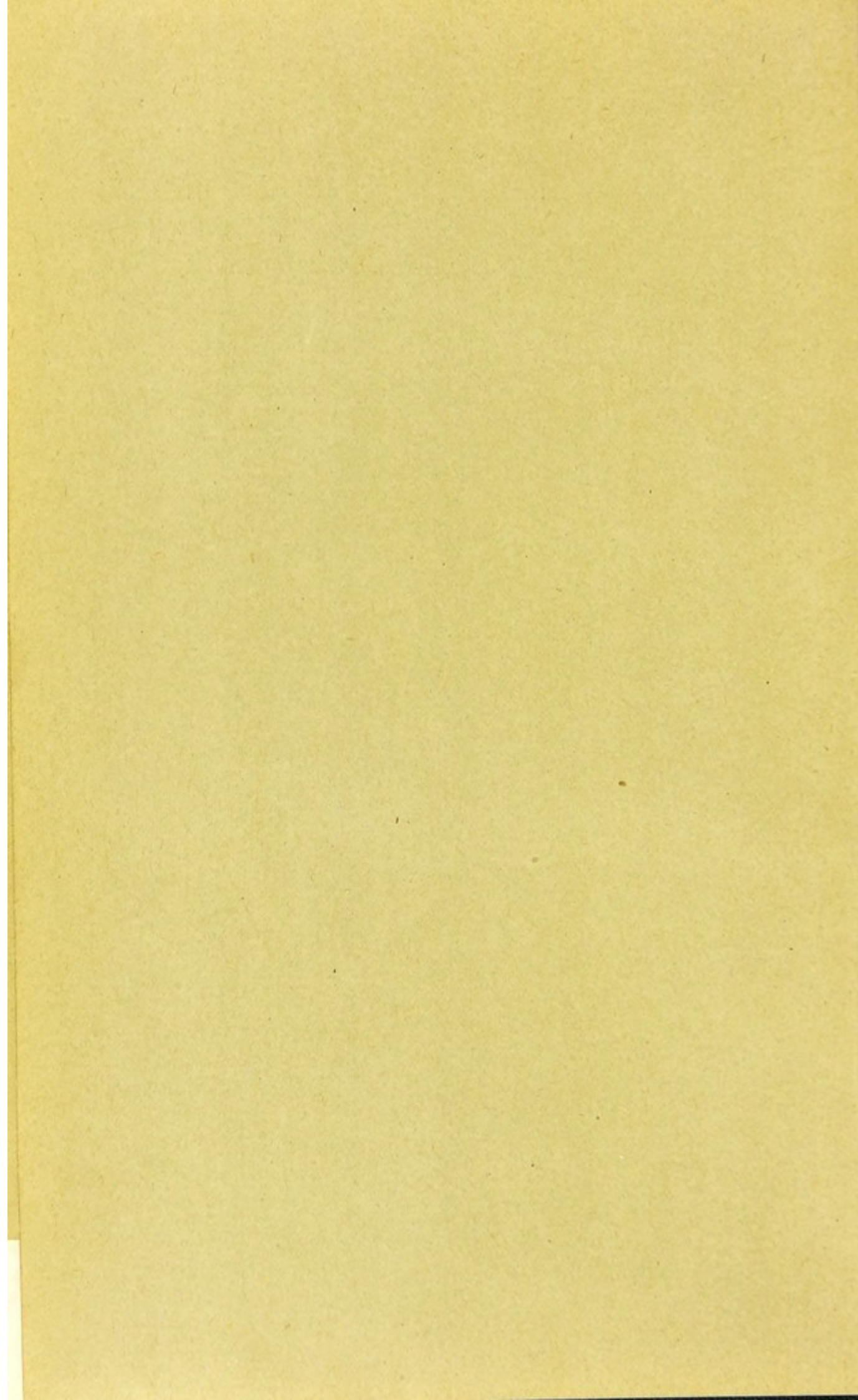


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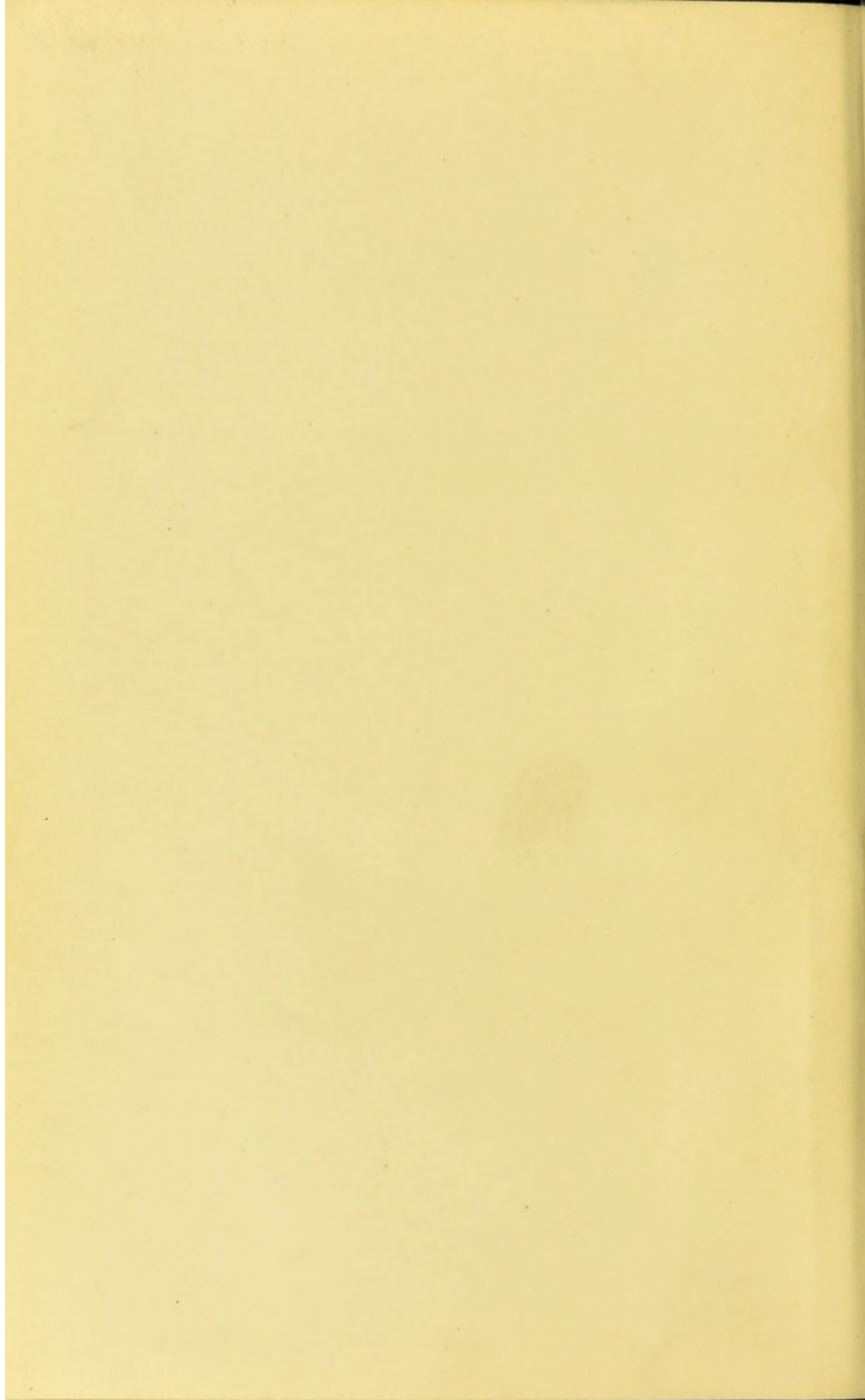


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A

MANUAL OF VENEREAL DISEASES.

BEING AN EPITOME OF THE MOST APPROVED TREATMENT.

BY

EVERETT M. CULVER, A.M., M.D.,

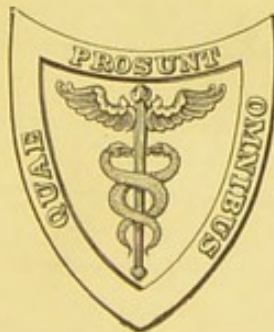
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WITH ILLUSTRATIONS.



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PREFACE.

K THE authors have undertaken to present in very condensed form a working knowledge of the three venereal diseases, Syphilis, Chancroid and Gonorrhœa. Intended as a monograph on the practical aspects of these affections for the use of students and physicians, all non-practical subjects, such as history, statistics, etc., have been purposely omitted.

NEW YORK, October, 1891.

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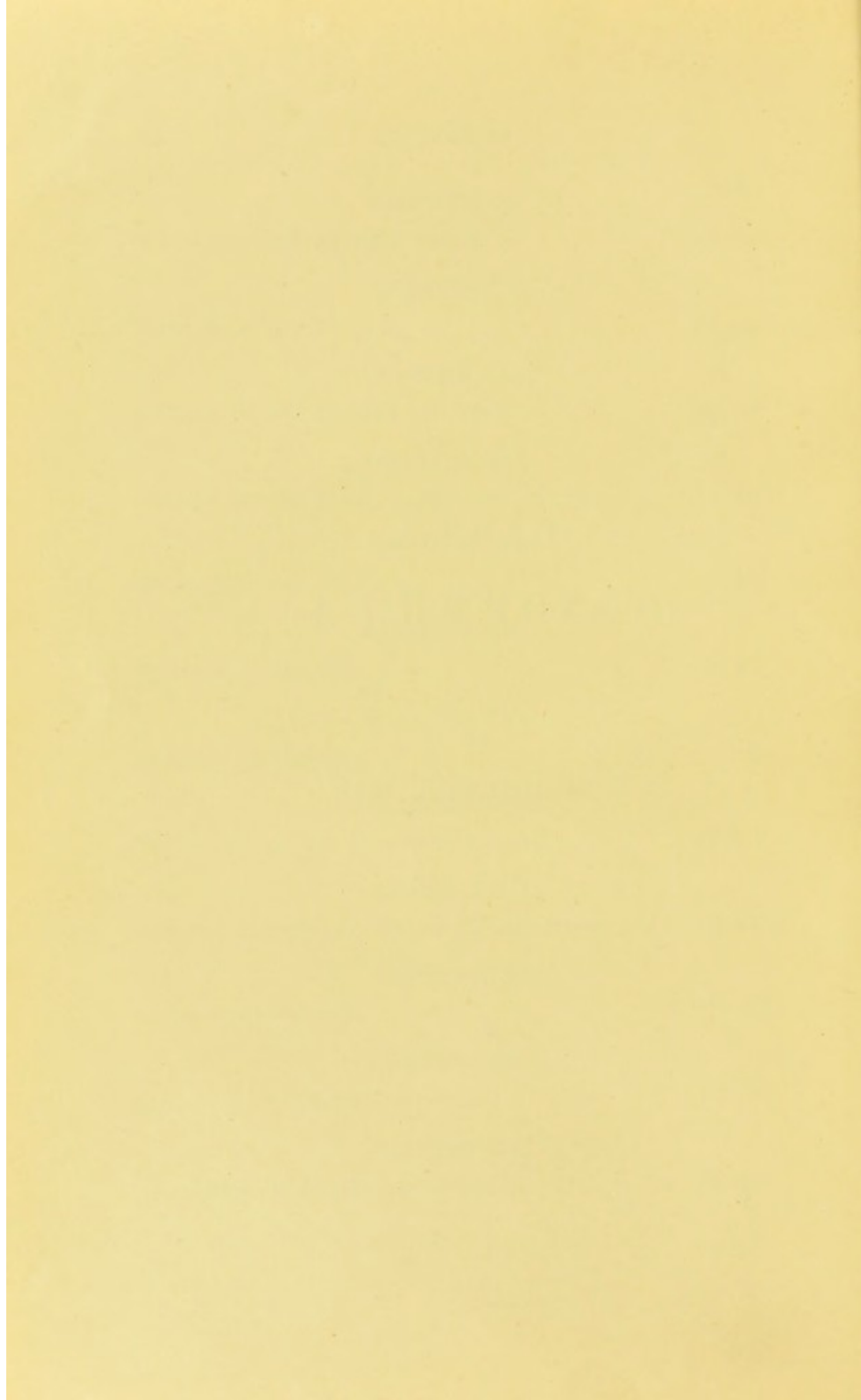
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PART I.
GONORRHOEA.

BY
E. M. CULVER, M.D.



GONORRHŒA AND ITS COMPLICATIONS.

CHAPTER I.

USUAL MANIFESTATIONS OF GONORRHŒA.

THE causation of gonorrhœa has of late years been a question of much study and of great controversy. Whether the infection is due to the presence of the "gonococcus" of Neisser, or is the result of an irritating variety of pus, will not be enlarged upon here, as time and space will not admit of extended consideration. It is sufficient to say that the diplococcus or gonococcus of Neisser is to be found in many, if not in all, of the active and especially acute examples of gonorrhœa.

The diplococcus or gonococcus may be readily shown by drying a drop of pus, which has been thinly spread upon a cover-glass, over the flame of an alcohol-lamp, by passing it slowly (*pus side up*) four or five times through the apex of the flame. The glass should then be floated (*pus side down*) for a few minutes on a watery solution of aniline oil colored by adding a watery solution of an aniline color, preferably either fuchsine or methylene-blue, and afterward washed by a gentle stream of water over the surface of the glass to remove the superabundant color. It should then be carefully dried on bibulous paper, and mounted in either oil of cloves

or balsam. When examined by a moderately high power under the microscope, there are to be seen in the protoplasmic or granular portion of many of the pus-cells a few black dots arranged in multiples of two, lying side by side; these are the gonococci of Neisser. Other cocci will be found occupying the same positions and of the same color, but not having the same numerical arrangement.

Having thus premised the cause (or effect) of an attack of gonorrhœa, we will consider the anatomical appearances and symptoms of the disease. So far as practicable, we shall first describe an acute attack, making, however, a few parenthetical remarks for the sake of clearness in the description. Where not specially indicated, all references are to the appearances in the *male* urethra.

It is very important, as we shall see later on, to bear in mind the length of the *incubation* stage. At periods of time ranging from four to nine days, having an average of seven days, after sexual intercourse, the patient, as a rule, if he be observant, notices a slight itching of the head of the penis, just about the meatus. This symptom is pretty constant in first attacks of gonorrhœa, but may be absent. An inspection shows the lips of the meatus slightly reddened, one side usually a trifle swollen and a little more prominent than the other. In a short time a sticky discharge, slight in amount, resembling the mucus of the prostatic urethra which one often notices after ungratified sexual excitement, oozes from the meatus; it is bluish in color and of a gummy consistency. He now notices that the urine in passing over the meatus causes a tickling sensation, with a slight desire to continue urinating.

Then, in quick succession, follows a thick, yellow discharge which soon becomes greenish, and, if the case be unusually severe, reddish from the admixture of blood from the swollen and fissured mucous membrane of the urethral canal. The passing of urine becomes extremely painful, at times even agonizing (*ardor urinæ*), the stream usually being twisted or fan-shaped, but on other occasions only passing from the meatus in scalding drops through the swollen and obstructed tube, the patient making violent efforts to repress the quick, normal delivery of the urine on account of the pain it causes.

As a rule, in severe cases the glans penis becomes a bright-red hue, and, with the prepuce, greatly swollen. If the latter be short or habitually retracted, paraphimosis may occur; if, on the other hand, it is redundant, it may become so greatly swollen and œdematous as to prevent its retraction and to hide from view even the meatus (*phimosis*). In this case the purulent and contagious discharge infects the mucous membrane of the glans penis and the prepuce, causing a balano-posthitis, or a simple balanitis affecting the mucous surface of the prepuce only.

Pain is also acute along the track of the urethra, extending to or even beyond the bulb. In case the inflammation is of a very severe type, it attacks the spongy tissue composing the corpus spongiosum, extending from within outward, and involving contiguous parts until the whole under portion of the penis is greatly swollen, the skin at the median raphe being well marked by a red line showing the lymphatic inflammation. Chordee in these cases is an annoying and painful accompaniment. Periurethritis and abscess may occur, of which more will be said under the heading of treatment.

All the above symptoms are present in degrees of more or less severity in every case of *acute* gonorrhœa. Many attacks are called acute which present a much milder course than above detailed, for the reason that there are many patients who give a history of repeated attacks of what they suppose to be fresh cases of gonorrhœa, but which, while no doubt due to excesses in drink, and of venery, and to a lowered standard of health, are, in reality, simple exacerbations of neglected discharges which have been either untreated or supposed to be cured.

In addition to the above symptoms, the primary infection may travel downward along the canal, occasioning acute inflammation of the prostatic urethra, involving that portion and the prostate gland sufficiently to cause retention of urine. One or more glands in the inguinal chain may be enlarged and tender, although they but rarely inflame and suppurate. Pains radiating from the penis to testicles, groin, cord, perineum and back may be complained of. There is little constitutional disturbance; perhaps some feverishness, nervousness, and a feeling of dragging in the back, loins, and perineum may occur. When the discharge is at its height, patients can often feel the pus falling drop by drop from the urethra, and experience a sickening sense of malaise, with great depression of spirits.

After the fifth to the seventh day from the onset, the discharge becomes more copious, and the chordee more troublesome, sometimes even rendering sleep impossible. An uncomplicated case tends to last from two to three weeks in its severe symptoms, then the discharge becomes less copious and less purulent in character, is thin and yellow, gluing the lips of the meatus together,

and finally passes entirely away at the end of some eight weeks or longer, or else becomes chronic and gleety. Ardor urinæ decreases and finally disappears, the patient again passing his water with ease. The swellings in the groin resolve, chordee ceases, and the patient at the end of eight to ten weeks is entirely well.

In order to present our subject more clearly, consideration of the *acute* attacks and treatment will be continued and concluded in the next two chapters, before we commence (in Chapter V.) the subject of *chronic* cases and their complications. The treatment indicated in the present section is supposed to deal only with cases not reaching lower than the bulb of the urethra. A gonorrhoea or urethritis tends to find points of selection at the fossa navicularis, or at the bulbous portion of the canal; if, on the other hand, the more posterior portions are involved, complications are caused, which are hereinafter to be considered.

CHAPTER II.

ACUTE GONORRHOEA : DIFFERENTIAL DIAGNOSIS AND TREATMENT.

WHEN a patient presents himself for treatment for gonorrhœa, it is needful to have clearly fixed in one's mind the picture of the disease. Exact knowledge of the parts involved is essential. A student will never master the subject of gonorrhœa, acute or chronic, until he has thoroughly studied the histology of the normal urethra, and the pathology of its diseases. In the whole range of surgery no other tissue is so much abused as the urethral mucous membrane. No other portion of the body is treated with so little regard to sound reasoning. When we consider that this membrane is as sensitive as the eye itself, is it wonderful that injections of astringents of almost caustic strength should cause nearly irreparable damage to so delicate a structure? Yet our journals constantly contain communications advising 10, 15 and 20 per cent. solutions of silver nitrate, or correspondingly strong bichloride solutions, for the abortion or cure of early cases of gonorrhœa.

The penis. As a measure of first importance to yourself and patient, always *examine the penis*. It may not be agreeable, it may not be æsthetic; it is always necessary, both for your patient's good and for your own reputation. It will not be enough to simply put questions as to symptoms of the disease; it is necessary to examine the penis, for several reasons. Should your

patient, for instance, have the long and redundant prepuce before spoken of, he may possibly have simply a balanitis—*i. e.*, inflammation and purulent discharge from the mucous membrane of the prepuce. The discharge may be as copious and as purulent as an acute gonorrhœa; the condition is only to be differentiated by retracting the prepuce to the meatus, wiping the exposed portion of the glans penis dry with a bit of cloth, and then making some pressure along the line of the urethra from behind forward. If pus appears welling out from the lips of the meatus the diagnosis of gonorrhœa is established.

At the same time an examination is to be made for other venereal diseases. It would afterward be very mortifying to have overlooked other complications, in the matter of hard or soft chancres concealed by the prepuce, and which might perhaps be discovered by the patient or by another surgeon. The condition of the inguinal glands should be ascertained, whether normal or tender, hard or inflamed. Not content with having examined the meatus to ascertain the character and copiousness of the discharge and the calibre of that opening, or the presence of concealed urethral chancroid or the infecting chancre, and the prepuce and glans penis for sores, warts, retained smegma, herpes, or other possible complications, we should also take the testicles and epididymis between the thumb and forefinger to see if there be or have been traces of epididymitis or orchitis, as evinced by hardness—in which case you may suspect former gonorrhœal or possibly syphilitic disease, notwithstanding the denial of your patient.

The urine. Having satisfied yourself upon these points, and believing the case to be acute, you will now

proceed to examine the urine. This examination should be made in all cases; one thereby discovers whether the reaction is acid or alkaline; if the specific gravity is very high the examination may lead to the discovery of a complicating saccharine diabetes, or the existence of a gouty condition, either of which will require treatment in order to insure the cure of your patient. Albumin will assuredly be present, from admixture of pus and blood. The microscopic examination of a few drops of the urine from the bottom of a conical glass which has stood in a protected spot for twelve hours will show if the bladder or the kidneys are diseased. Test-papers for your examinations need to be very fresh, and must be protected from the fumes of the laboratory by keeping them in salt-mouth bottles with ground-glass stoppers. Relative degrees of acidity of the urine are, of course, declared by more or less redness of the paper. All apparatus should be scrupulously clean, especially the conical glasses, since sediment from a former specimen might show in the slide next prepared.

Treatment. Having ascertained the character of the urine by the preliminary chemical analysis, inquire whether urinating causes much pain. For this very disagreeable and one of the most prominent symptoms of the first week or ten days, your chemical analysis has prepared you to answer. The urine, which is physiologically acid, needs to be alkalized by some alkaline mixture, and furthermore diluted by mechanical diluents, as by large quantities of milk or pure cool water. If vesical irritation is evinced by the frequent desire to urinate, or an uneasiness of the bladder accompanied by a feeling of heaviness just over the pubes, the addition of a little sedative to your alkaline solution will help

very materially to make your patient easier. Sodii bicarb., $\mathfrak{Z}$ ss to half a glassful of water, taken two hours after meals to prevent the alkali from disturbing digestion, will be all that is necessary in light cases. With such cases as the one described above, one of the following prescriptions fulfils all that is required:

I.

"Mist. Hyoscyami"—Vanderbilt Clinic.

R.—Potass. acetat. grs. xx.
Tinct. hyoscyami $\mathfrak{M}$ xv.
Aquæ q. s. ad f $\mathfrak{Z}$ j. M.

Sig: $\mathfrak{Z}$ j dose, t. i. d., two hours after meals.

Or,

II.

R —Potass. citrat. grs. xv.
Syr. limonis f $\mathfrak{Z}$ ss.
Aquæ q. s. ad f $\mathfrak{Z}$ j. M.

Sig.: $\mathfrak{Z}$ j dose, t. i. d., two hours after meals.

Or,

III.

R.—Potass. citrat. } āā grs. x.
Potass. acetat. }
Tr. hyoscyami $\mathfrak{M}$ xv.
Fl.-ext. rhus tox. $\mathfrak{M}$ ij.
Syr. limonis $\mathfrak{Z}$ ij.
Aquæ q. s. ad f $\mathfrak{Z}$ ss. M.

Sig.: $\mathfrak{Z}$ ss dose, t. i. d., two hours after meals.

No. I. or III. is indicated when there is bladder uneasiness.

It is not necessary to give these alkaline mixtures daily if we can examine the urine from day to day; all that is needed is to keep the urine bland.

Soaking the penis in water as hot as can be borne relieves the swelling; at the same time urinating into the water renders the act somewhat less painful.

Rest is one of the most essential elements of success in

the treatment of acute gonorrhœa. Could one compel patients to take to their beds for twenty-five days, and be lightly fed, the urine being rendered bland with the weaker alkalies, there would be little else to do. Most patients will not submit to this treatment, or cannot do so.

Mechanical aids. Epididymitis should be guarded against by wearing a snug and well-fitting suspensory bandage. A badly fitting suspensory bandage is of no use whatever, since it only annoys the patient by chafing him, does not properly suspend the testicles, or presses against the urethra by its faulty fit around the penis. Rather than wear such a one, it is better to make a well-fitting bandage from a piece of fine linen mull, such as is found around cork helmets and known as a "pugaree." This strip of linen is from one and a half to two yards long and eight to ten inches wide. Take one end of your bandage and hold it at one side of the body; then make a little more than a complete circle of the body. This furnishes a belt. At the middle of the back pass the free end of the muslin through the belt so as to come down like a tail; then bring this end up between the legs like a T-bandage; spread out the scarf to the extent of its width; roll up the edges on either side until they include the scrotum in their folds; finally, pass the end under the belt in front and pin it with a safety-pin. This forms a splendid support for the testicle and scrotum, but it is inconvenient on account of the trouble one is caused in attending to urination, etc.¹

¹ One of the best suspensory bandages is that made by Mrs. J. C. Schnoter, of 523 Sixth Avenue, New York. It has a well-fitting and correctly shaped bag, and light and well-fashioned waist- and thigh-bands. These bandages may be found in almost any good drug-store. They will prove most comfortable and effective.

Diet. All beer, ale, and sweet wines—in fact, all stimulating drinks—should be strictly prohibited; likewise all spices and condiments, since such stimulating and aromatic substances are eliminated by the kidneys and tend to further inflame the urinary tract.

To secure sleep. The chordee, which is apt to be more or less troublesome during the first week or two of the attack, is best treated by prolonged immersions of the penis in hot water just before retiring, and sleeping in a cool room, lying lightly covered, and always on the side. To prevent lying on the back a very long towel should be knotted in the middle, and by placing the knot over the spine, and pinning both ends together over the belly, a mechanical hindrance to the supine position accomplishes the object desired. Should these milder efforts not succeed, large doses of lupuline, from thirty to sixty grains, should be taken upon retiring, or a suppository of opii aq. ext. gr. j, ext. bellad. gr. $\frac{1}{4}$.

Caution should be exercised about handling the penis from which a purulent discharge is flowing, in order not to convey the affection to the eyes; for the same reason the clothes should be guarded from contact with the pus by dressing the penis with soft cloths or cotton. A mode preferable to all others is available where the foreskin can be utilized to retain a bit of absorbent cotton over the meatus, or to hold a piece of gauze about three inches square, with a small hole in the middle, which is slipped over the glans behind the corona, the prepuce being then pulled forward. Where the patient has a short or circumcized foreskin, a light bag or half swimming drawers are to be recommended. No voluminous wrappings or apparatus should be worn which would heat or poultice the penis.

The question of duration of an acute attack of gonorrhœa is always a perplexing one, and it is unsafe for a physician to promise a cure under ten to sixteen weeks, and even then complications may occur which still further lengthen the disease to many months. Those attacks we hear of as being cured in ten days are most assuredly bastard, or are the acute exacerbations of chronic cases.

CHAPTER III.

ACUTE GONORRHOEA: THE RETROGRESSIVE STAGE AND COMPLICATIONS.

HAVING reached the height of the attack, accompanied by many or all of the above-related symptoms, the disease now commences to retrograde. The discharge loses much of its purulent nature, the amount is less, and in the place of copious greenish pus the secretion is sometimes barely colored with pus, at other times is only a light yellow. The stage called muco-purulent is now reached. With this event a change of treatment is necessary. The necessity of alkalinizing the urine is not so great, and now that the acute inflammation is diminishing, we can commence to soothe the urethra with the action of balsams. Such mixtures as the following are now appropriate:

R.—Balsam copaibæ	}	.	.	.	āā	℥ss.
Spt. lavandulæ comp.						
Spt. æther. nit.						
Liquor potassæ	.	.	.	.	.	℥ss.
Olei gault.	.	.	.	.	.	℥ij.
Mucil. acaciæ	.	.	.	.	q. s. ad	℥iv. M.

Sig : ℥j-℥ij dose, t. i. d., after meals.

Or,

R.—Capsules olei santal. (P., D. & Co., No. 6). Sig.: One to three, t. i. d., after meals.

The above mixture, known the world over as the "mist. Lafayette," is one of the many modifications of the much-used "balsamic mixture."

Desiring to indulge in no hypotheses or discussions,

and while giving, as nearly as possible, personal experiences that have stood the test of time, yet a little excursion may here be taken from the text to inquire as to the value of balsamic mixtures. Taking up no positive position in advocacy of any of the treatments suggested in this book, we are at perfect liberty to look at the accumulated evidence for or against them, letting the practitioner choose for himself. The "mist. Lafayette" is evidently of French origin—whether or not the gay general whose name it bears was its introducer or originator matters not. It is the routine custom with French practitioners to treat gonorrhœa by the expectant method, and to this end to give sandal-wood oil or balsamic mixtures for many weeks before treating an acute clap with injections. Having been associated for many years at the New York Hospital with several eminent specialists in skin and venereal diseases, and especially through the kindness of my friend, Dr. L. Duncan Bulkley, I have had countless opportunities to see the effect of time and the use of balsamic mixtures upon acute clap. Without doubt, *both* are operative elements in effecting a cure.

The youngest practitioner knows fully that it would never do to send his patient home to drink flaxseed tea and abstain from liquors and condiments, without other treatment, for his patient would not only be no source of revenue to him, but would lose confidence as well, as he saw week after week pass with hardly any perceptible diminution in the discharge. Yet, when our records show that after three to four weeks upon the alkaline or hyoseyamus mixture the discharge becomes muco-purulent, we then order the balsam mixture; patients are each time a little encouraged by an assur-

ance that they are doing well, and continue to take the Lafayette or other balsamic treatment until six to eight additional weeks have elapsed, and thus is accomplished the object of their desire, namely, a cure. My experience at the Vanderbilt Clinic has confirmed this. Rather than run the risk of complicating the urethral discharge by adding thereto the far-reaching effects of epididymitis and its train of deep-seated results by having used too early strong injections, my own preference leads me to follow a very conservative method in the treatment of acute clap; and this is done by patiently following the expectant method, with the real or the moral effect, whichever one may choose to call it, of internal mixtures.

So many eminent specialists have decided respectively for and against these mixtures, that, aside from the acknowledged effects of the liquor potassæ, it would be folly for one to make any positive assertion as to their real value. That copaiba, cubebs, and gurgum do stimulate the mucous membrane is not to be doubted, since a glance at any formulary will show that all are used for their effects upon the respiratory and gastric mucous membranes—these balsams analogously affecting the mucous membrane of the lungs (by first passing through the circulation), as in producing their effects upon the genito-urinary tract. It is not likely that copaiba is one particle better than sandal-wood oil, aside from its cheapness, which in hospital practice must be an element largely in its favor. The disagreeable feature of copaiba eruption and the well-known tendency of the drug to disagree with many delicate stomachs when given in large doses, must make its synergist, the oleum santal, always to be preferred. It is but fair, however,

to bear in mind that by good management in selecting the hour after or before meals at which the dose is to be taken, copaiba mixtures are often well borne, and may even be continued over long periods of time.

Santal oil is absolutely worthless as purchased in many drug-shops, and we can only hope to obtain its best effects when absolutely pure and of the yellow variety. When prescribed it should be distinctly ordered as furnished by Parke, Davis & Co., in capsules, with that firm's guarantee of its purity. This variety of oil may also be advantageously and elegantly ordered by taking equal parts of the oleum santal and spt. ætheris nitrosi dulcis, with oleum cinnamomi one-eighth part, and the emulsion of almonds as an adjuvant; *e.g.*,

R.—Olei santal	}	.	.	.	.	āā	gtt. viij.	
Spt. æth. nit. dulc.								
Olei cinnamomi .	.	.	.	.	.	.	gt. j.	
Emul. amygd. dulc.	.	.	.	.	q. s. ad	℥j.		M.

Sig.: ℥j-℥ij dose, t. i. d., after meals.

The use of oleum gaultheriæ as a flavoring for the Lafayette mixture is to be desired, for, aside from its universally favorite flavor with the American public, the salicylic compound may very obviously help those cases which are rheumatically inclined, since we know that many cases of lithæmia and rheumatism are thus successfully treated.

If one prefers to use injections they may also be used at this time. And here great caution must be insisted on in the use of hot or cold bichloride of mercury or powerful silver nitrate solutions. The number of remedies suggested for injections in gonorrhœa is best illustrated by counting on one's fingers those that have not been advised out of the whole pharmacopœial list.

Before completing the subject of treatment of acute gonorrhœa, attention must be called to a method of treatment known as "the hot bichloride injection or retrojection," which had a decidedly thorough test in this city, and although there are a few surgeons who still continue it without the use of hot water, using the bichloride in tepid solution only, it may be remarked that the millennium for gonorrhœa has not yet been reached. So exaggerated were the claims made for the bichloride of mercury solution, as hot as the patient could possibly bear it in his urethra, in strengths varying from 1 : 20,000 to the weaker ones of 1 : 40,000, that one surgeon, in addressing a medical gathering, declared that, by the use of this remedy for acute gonorrhœa, "the work of the genito-urinary surgeon would soon pass away." The obvious fact remains that the *remedy* is passing away. After the careful use of the method in eleven cases, the results from epididymitis, cystitis, and empty treasury, by driving patients away to more conservative surgeons, were so disastrous that my conclusion regarding the remedy as a lurid failure has held good for five or six years; and pail, rubber, lamp and Halstead glass nozzle have been numbered with my museum curiosities.

It is far better to use with intelligence one or two well-tried injections rather than many. Our own preference is for the following :

Professor R. Ultzmann's.

R.—Zinci sulph.	}	.	.	.	āā	grs. vj—grs. xij.
Alum. pulv.						
Acidi carbol.	.	.	.	.	.	grs. iv.
Aquæ	.	.	.	.	.	q s. ad 5vj. M.

Sig.: Injection, three or four times daily, commencing with the weaker strength at first and gradually increasing to the limit.

"Inject. Bismuth."—*Vanderbilt Clinic.*

R.—Bismuth. subnit. $\bar{z}$ ss.
 Glycerin.¹ [or better, Mucil. acaciæ] . . . f $\bar{z}$ j.
 Aquæ q. s. ad f $\bar{z}$ iv. M.

Sig.: Inject three or four times daily.

Or,

R.—Potassii permanganas grs. ij—grs. iv.
 Aquæ destil. $\bar{z}$ iv. M.

Sig.: Inject three or four times daily.

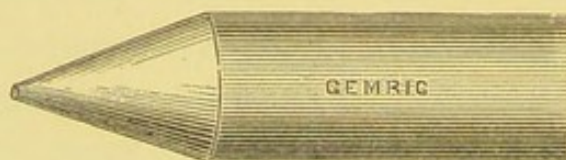
Or,

R.—Zinci permanganas gr. ss—gr j.
 Aquæ $\bar{z}$ iv. M.

Sig.: Inject three or four times daily.

A matter of essential importance is that of the syringe used for injecting the urethra, since many a stricture of the fossa navicularis has been caused by the long or rough nozzles of syringes. The ideal syringe is known as the Royal "P" syringe, represented by Fig. 1 (the

FIG. 1.



Syringe for injecting the urethra.

artist, however, having represented it with a little too pointed a nozzle). The blunt end makes but a slight entrance into the meatus, and thereby avoids the liability attaching to other syringes, of leaving an ulcerated spot after many times using. Injections should only be made after urinating, which clears the tube of pus. The fluids should be slightly warm. Air is to be

¹ Personally I am opposed to glycerin in injections, as being too stimulating to the mucous membrane in acute cases.

excluded by bringing the fluid to the orifice of the instrument before injecting. The injecting solution should never cause pain or bring on severe desire to urinate. Drive the piston home slowly, allow the medication to gently distend the urethra, hold the meatus closed for a few moments, and the act is accomplished.

In the later stages, when the discharge is only slightly watery, nitrate of silver solutions, varying in strength from one-eighth to one and a half grains to the ounce, may advantageously be used as astringents.

The surgeon may also use a retrojection method that is sometimes very beneficial, as follows: Take a Mercier catheter-coudé, attaching to it a piece of rubber tubing, and having lubricated the catheter with glycerin (*never with a greasy substance*, since the grease would coat the urethra with a film, and prevent the contact of the medicating element of the injection), introduce the instrument to the depth of three and a half to four inches—*i. e.*, to about the region of the bulb; fill a syringe with a warm solution of carbolic acid and water (one-fourth to one-half grain to the ounce), or with a weak solution of zinc, alum, and carbolic acid, and gently flood the urethra from behind forward. The catheter not completely filling the canal, the solution is permitted to flow out of the meatus into a basin held under the penis. Such injections carefully given need never cause complications, as they wash out only the pendulous portion of the urethra. Injections by means of syringes with blunt nozzles may be used by the patient himself, if care have been taken to carefully instruct him and explain the method.

To recapitulate: let us remember that sound reasoning is to govern our treatment of acute gonorrhœa in the

same manner as in other inflammations. The urethra, being a closed tube except when pressed open for the flow of the genito-urinary fluids or by the passage of an instrument, necessarily retains the débris of inflammatory products more than in the case of a catarrh in other situations. The disease is to be regarded as an *acute inflammation* at first, and later as a *catarrh*—a catarrh rather than something indefinite to be punched out with a sound or burned away with caustics. A similar catarrhal inflammation in the mucous membrane of the mouth, for instance, would be treated by soothing applications, abstinence from sharp or spiced viands, and the best conditions of rest and general health. And in gonorrhœa the indications are to render the urine bland, to keep the parts scrupulously clean, to spare fatigue and undue determination of blood to the pelvic organs by securing rest as much as possible, to avoid all irritating food and drink, to keep the bowels gently moved, and to exercise caution in order to prevent damage to other parts. And further, when the acute stages have been passed, to medicate by means of soothing substances which exercise their mildly stimulating and healing powers by coating the urethra in passing out with the urine. If necessary, astringe and cleanse with gentle injections, doing nothing to force the infectious material further back than its own point of limitation, and keeping well in mind the complications that result from the ill-advised passage of instruments and from forced injections. If inflammation attack the spongy portion of the urethra, as we have before mentioned, the treatment should be on the same rational plan as inflammation in other localities. The penis should be lightly wrapped

in absorbent gauze cloths, which are to be kept wet with the lead and opium wash following :

R.—Liq. plumbi subacetat.		℥j.	
Tr. opii		℥ss.	
Aquæ		q. s. ad	℥j. M.

Sig.: Shake well. For external use only.

The flimsy character of the dressing allows the lotion to evaporate.

It sometimes happens that swellings are located about a tolerably large follicle, and as such follicles are found in greatest number and size at the fossa navicularis and at the bulb, therefore these small abscesses appear with most frequency at these points—more often at the former, where they are generally of less consequence than at the latter situation, in which case they are quite serious. The opening or mouth of the follicle becoming closed, inflammation of the surrounding tissue causes their contents to suppurate, when they become small abscesses. The tendency is for these abscesses to thin toward the centre and discharge their contents into the urethra; it is very rare for them to break externally. Such an event would naturally cause a very troublesome fistula, which, if low down near the peno-scrotal junction of the urethra, would necessarily be an acquired hypospadias, troublesome alike in regard to both urinary and genital functions.

Great pains should be taken by the surgeon to dissipate these swellings if possible. They should not be encouraged by poulticing to break externally; nor should instrumentation be practised within the canal, for fear of involving the peri-cellular connective tissue of the whole length of the urethra.

In case a fistula is left, it will be best to wait until

all inflammation has subsided, when a reparative plastic operation should be made to close the hole in the urethra.

As the rarest complication of *acute gonorrhœa* we may speak of retention of urine from swelling of the prostatic portion of the canal, either from swelling in the urethra itself, or from an acute swelling of the prostate gland. In either case the result is the same: the swollen or occluded canal does not permit the passage of urine. What the treatment should be in such cases is somewhat problematical. The bladder may be evacuated by means of the aspirator, or by a curved trocar through the rectum; also may be mentioned iced-water injections into the rectum, hot poultices to the perineum, or a large number of leeches. The writer knows of but one case of this sort in his experience, and this one assuredly could not have been a very bad attack. In this instance the urethra was carefully washed out, to avoid introducing infectious material into the bladder in front of the catheter, which was a Mercier coudé, and the contents evacuated. Its passage, however, caused such pain that the patient fainted. Ice was applied to the perineum and in the rectum so persistently for the next six hours, however, that with opium and in a warm bath the patient was able to void his urine without further instrumentation.

BALANITIS.

Before concluding the subject of acute catarrhal affections of the anterior genito-urinary tract and organs, it will be necessary to speak of balanitis, *i. e.*, inflammation of the mucous membrane covering the glans penis and foreskin. Secretions of an irritant or virulent character may be taken up by a long and tight

foreskin, thus saving the urethra from contagion ; or from a gonorrhœa discharging into the long or the tight prepuce balanitis is set up, with the subsequent swelling connected with a catarrhal inflammation; the orifice of the prepuce being more or less closed. Singularly enough, this condition may last for a long time without setting up contagion in the urethra. The purulent discharge may flow from the opening of the prepuce, and the patient may believe that he has gonorrhœa. If not relieved by the means of washes or operation, the catarrhal inflammation causes in time an ulceration which erodes the head of the penis and the adjacent foreskin. If the preputial opening is small, the urine balloons the pouch, and in contact with the raw and irritated surfaces causes intense pain, simulating still more a gonorrhœal attack. It is thus seen how necessary are the personal examinations to correctly diagnosticate between balanitis and gonorrhœa, or to recognize both, since the treatment for each is entirely different.

If the foreskin can be retracted behind the glans penis the cure is made with ease and in a very short time. Little more need be done than to carefully wash the affected surfaces with warm water without soap, or to apply a slightly astringent lotion, such as the following :

"Red Wash"—New York Hospital.

R.—Zinci sulphat.	.	.	.	.	.	℥ij.	
Spt. lavand. comp.	.	.	.	.	.	f 3j.	
Aquæ	.	.	.	.	.	℥j.	
Cochineal coloring	.	.	.	.	.	q. s.	M.

Sig.: For external use as a wash.

Should slight ulceration be present, a little finely powdered calomel, starch, boric acid, or iodol may be dusted on the glans and foreskin.

A much more serious aspect of the disease is found when the preputial opening is very narrow. In extreme cases little short of forcibly stretching the opening or slightly slitting it will be of any use. Where, however, we can insert the nozzle of a syringe, supplemented by bits of cotton wrapped around the end of a wooden toothpick, and by mechanical means clean out the cul-de-sac and medicate the surfaces, we shall be able to treat and cure the disease without much trouble. After swabbing out the folds as far back as the corona, and making all as clean as possible, the nozzle of the syringe should be inserted alongside of the glans penis, taking care not to introduce it into the urethra; then carefully syringe out the space between the prepuce and glans penis, using either the *lotio nigra* of the *Pharmacopœia*, or a slightly astringent solution—*zinci sulphat.* gr. ss and *acidi carbol.* gr. $\frac{1}{4}$ to the ounce. As the inflammation decreases, the narrow opening of the prepuce may admit of retracting the skin behind the glans penis, when the completion of the treatment will be an easy matter—proceeding then as in simple cases.

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CHAPTER IV.

TWO PERTINENT QUESTIONS.

BEFORE leaving the subject of acute catarrhal urethritis two very pertinent questions remain to be discussed.

First: We are very often asked whether a man can contract a gonorrhœa from his presumably virtuous wife. Eliminating all outside questions regarding the chastity of the woman, and also taking for granted that the man has honestly come for advice, and not in a hypocritical way, expecting to throw the blame of his own lechery upon an innocent spouse, we must answer: There is no reason why a man may not contract a discharge from his honest bedfellow.

The chances, however, are strongly against it, for the male urethra seems to accustom itself to all sorts of evil conditions if sexual hygiene be only observed. That is to say, a man may have connection with his mistress or his wife for years and not contract a discharge, although the female may be suffering from a purulent leucorrhœa, or even the discharge from a carcinomatous growth, or a tuberculous ulcer of the cervix.

To account for various claps or urethral discharges contracted from fast women, "kept women," and "soft snaps," men are very willing to believe that as the female was "just over her courses," etc., she is not to blame for the disease; and women of such character take good care to foster these beliefs in men's minds, so that if by chance their illicit partners are infected,

the attack may be attributed to natural causes. Almost every student has read Ricord's celebrated recipe for contracting gonorrhœa, which recipe is no doubt true, even without the addition of the injection. There is a very strong belief among genito-urinary surgeons that certain temperaments of men may contract gonorrhœa more easily than others—its effects, too, lasting longer, all things being equal. These men are usually of a lithæmic diathesis. It is reasonable to believe that systems which are liable to diseases of the joints and serous membranes should be easily affected by reason of the irritable condition of their mucous membranes, *plus* any additional source of irritation. Since it is abundantly demonstrated that the most healthy vaginæ may contain diplococci almost identical in appearance with the gonococci, it is not irrational to suppose that under certain conditions these may cause a discharge very similar if not identical with gonorrhœa. On the man's side, a chronically granular urethra, a half-cured chronic urethritis, under peculiar circumstances, or excessive acts of coitus, coupled with the existence of a vaginal discharge of any nature, may give a superadded irritation sufficient to cause an outbreak of an old trouble long latent.

But again, without doubt there *are* cases where idiopathic discharges are contracted with innocence in both sexes. It is our duty to advocate this theory, even if we cannot in some instances see our way to a solution of the genesis of the disease as clearly as we wish. A doctor's word may often be the cause of divorce or of long and bitter controversies and mutual accusations, when perhaps neither party was at fault. Especially to clinic and dispensary patients it is always best to answer positively that it is possible for a man to acquire disease

from an honest woman. Do not disturb their less intelligent minds with questions which only arouse their suspicions.

Another query remains: How long a time should elapse before a man may marry who has had gonorrhœa?

Opinions upon this question may vary over very wide limits. The condition of the system, the special state of health, the normal character of the urine and of the semen, the turbidity of the former and the variety of the sediment have much to do with forming an opinion. The consequences of clap in the woman are perhaps even worse than the subsequent effects of syphilis, and it is needless to point out how the infection travels up the canal of the womb until the tubes are affected—setting up pyosalpinx. This question is, therefore, of immense importance.

German writers are very pronounced in their opposition to allowing marriage while any abnormal elements are showing in the urine. Finger has formulated rules that would exclude almost every man who had ever suffered from chronic gonorrhœa or urethritis from marrying. No flocculi must be present, not a pus-cell in the field. The microscope must not show an abnormal cell-element, nor must stricture be present. The following are the rules as they appear in Finger's book:

After the patient has asked permission to marry, and has been carefully examined for a lengthy period, he must be prohibited until—

“First. After from two to four weeks of daily observation the secretions from the urethra are found to be free from pus and made up wholly of epithelial cells.

“Second. No gonococci can be detected by the microscope, even after a purulent discharge has been estab-

lished by the employment of irritating injections of corrosive sublimate or nitrate of silver.

“Third. Neither prostatitis nor stricture exists.”

I have been often surprised to find patients suffering from stricture, with an amount of pus sufficient with the flocculi to make the urine turbid, and giving a history of several claps before marriage and subsequent symptoms of stricture, who had not in the least infected their wives.

But that there is danger is evident, and when the microscope shows the gonococci present in the pus upon repeated examinations, it is proper to inhibit matrimony. While it is not positively settled whether gonorrhœa is dependent upon the gonococci, the arguments in favor are so weighty that we ought to consider their presence as *prima facie* evidence of the contagiousness of the discharge, when advising upon this question. My own idea is, that when a man is free from stricture, has but a gleet discharge which has lasted some years, feels perfectly well, has no irritability of the bladder, and has the desire to marry, the chances are that sexual hygiene will so improve the condition of the urethral canal that marriage will do him good, and that he will never infect his wife.

Our excellent means for diagnosis, and our knowledge that the presence of gonococci may mean mischief to the woman, place us in a position to speak pretty positively upon this question.

Keyes, speaking on this point, says: “A regular, moderate exercise of the sexual organs tends surely to keep down congestion and allow that rest which is most important in effecting a cure. Yet 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 so. In all cases of prolonged purulent discharge or gleet, a lesion in the urethra (stricture, 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."

In conclusion, it is but fair to give a few opinions upon the pessimistic side of this question of infection.

Noeggerath, in a paper published in 1872, concludes that a man who has once had gonorrhœa never fully recovers. He states that nine-tenths of all women married to men who have had gonorrhœa, sooner or later become the subject of incurable and painful inflammatory diseases of the tubes, the uterus, or the ovaries.

Dr. Brewer, of New York, records in the *Journal for Genito-urinary and Cutaneous Diseases* the case of a young man who had had a tedious case of gonorrhœa six years before, which had lasted twelve months. The patient asked if he was fit to be married. Upon examination Dr. Brewer found the meatus to be 28 French, the urethral capacity 32 French, and a stricture (?) of 30 French at three inches. The case is further stated to have been treated by cutting operation, endoscopy, etc., for five weeks, when the patient declared he would wait no longer, and was married. Shortly after, the man's wife was seriously ill with an acute vaginitis, peritonitis, and all the evil consequences of acute gonorrhœal disease. Many of us would obviously turn our attention to the discovery, if possible, of a more recent date of infection, but Dr. Brewer assures us that he *knew both families very well*. Perhaps such an infection might have been from the latent gonorrhœa, perhaps not.

CHAPTER V.

CHRONIC GONORRHŒA : URETHRITIS ANTERIOR WITHOUT STRICTURE.

A NUMBER of cases of acute gonorrhœa running its usual length of time—from eight to twelve weeks—tend to get well, even when untreated. The greater number of cases, however, if treated by irrational methods, or if left alone, become chronic. In the acknowledged absence of a specific for the cure of acute gonorrhœa, it is perhaps just as well to let the disease develop somewhat into its later stages before beginning to attack the disease in the urethra by medicinal agents.

An anatomical division of the urethra into an *anterior* or peno-scrotal portion, from the meatus to the triangular ligament, and a *posterior* portion, from that ligament to the posterior border of the prostate gland (neck of bladder), is recognized throughout the ensuing paragraphs describing chronic conditions.

We have seen that uncomplicated cases of gonorrhœa, as a rule, are limited to the anterior portion, and, having been properly treated, get well in periods varying from eight to twelve weeks, or else become chronic and last indefinite periods of time—the latter state being found in those cases that have been untreated or neglected. We shall find these patients, as a rule, anæmic, in poor health, and with more or less discharge, either running continuously, or upon awaking in the morning they find the meatus glued together, and when it is forced open, a

quantity of pus is disclosed at this point which has been collected during the night within the urethra. Other patients are comparatively free from discharge while they live very regular and continent lives, only having a renewal of the discharge after a night of venery, or upon drinking beer or sweet wines. Upon this very point alone we have often made the diagnosis of chronic gonorrhœa, that is, from the very rapid appearance and the painless character of the disease.

It is of every-day occurrence with us at the Clinic to find patients with the history of a profuse discharge coming on the next day after connection, or, at the longest, two days afterward. As before pointed out in the description of acute cases, this time element is of value; primary attacks seldom begin to discharge profusely until the ninth to twelfth day after sexual contact. When we hear that the discharge commenced at such an early period after contact, we know that we have to deal with an acute exacerbation of a chronic latent process, which may have been unsuspected by the patient. The discharge in these cases may be quickly stopped by the exhibition of the "mist. Lafayette" and a slight astringent injection; a radical cure, however, is not so easily accomplished.

Thus it is that the "drying up of the discharge" is often considered all that is necessary, and thus also it is that when patients are told that we shall be unable to cure them from their *first cases* in less than six to ten weeks, they generally retort that friends have recommended them to a doctor who can cure them in ten days. But, treat them as you may by these totally inadequate measures, the same condition will be repeated upon overstepping in the least the rules of perfect living.

Careful questioning and examination will develop the fact of a precedent clap, which may be called "a strain," or whatever else you will have the patience to listen to. The meatus will probably be red; the head of the penis blue and cold; the urethra tender and sensitive at certain points. Also there is present a hard and gristly feeling, which is much more noticeable when the patient urinates, and in some cases is enough to materially interfere with urinating, the stream being twisted and hard to force from the bladder. An examination of the shirt-flap upon its under side often shows slight stains from a scanty discharge which the patient has failed to note.

Upon urinating into a glass vessel, long threads will be seen floating in the urine. These threads or flocculi (called by the Germans "Tripper-fäden") are long, thin and transparent, and differ from those later to be described as coming from the posterior portion of the urethra, being longer, thinner and less in number; the little flocculi of the posterior portion—"nail-" or "tack-" shaped, rolled up on one end—being in some cases numerous enough to give the urine a cloudy appearance. We shall not discuss the hypotheses as to the origin of the flocculi—whether dead epithelium from the surface of the mucous membrane, or whether "casts" of the follicles; it is sufficient to say that they are almost invariably present, and that microscopical examination of such urine will find them composed of epithelium upon a sort of basement membrane holding pus-cells within it, while free pus-cells are also to be found in the urine.

Inquiry should be made whether the patient has ever had irritation of the bladder during the acute stages of his gonorrhœa, or an epididymitis, since one or both

of these complications will indicate that the infection has been forced or has travelled back to the posterior portion. You will always find pus in the urine of these patients at some time during the course of their treatment, upon repeated examinations; and herein lies the *raison d'être* of the indefinite continuance, the pathological condition, and the success of rational methods of treatment. As we have before mentioned, this portion of the urethra is a closed tube, except during urination or the passage of an instrument.

Let us take a rather novel view of a chronically inflamed anterior urethra. The mucous membrane, covered with pavement and columnar epithelium, has in its deeper mucous structure the little pits of Morgagni and a number of ill-formed compound racemose glands, the glands of Littré, these being more numerous about the fossa navicularis and at the bulb—and it is at these situations that the disease most frequently centres. Consider the irritating character of the urine, containing often minute crystals, generally acid in character, and holding organic matter in solution. Bear in mind that these little pits and crypts have been chronically inflamed, their deeper parts affected, their outlets choked up by the general œdema of the tube, and the want of tone of the circular muscular fibre, which does not thoroughly clear the canal of urine. All these factors contribute to make an analogous condition to a fistulous tract. Sound surgery would teach us in other situations to lay open the tract and scrape out the offending conditions, that Nature might have a chance to effect a cure by healing from the bottom. It is, of course, needless to say that this cannot be done in this disease; but we have at our disposal a means which very nearly

approaches the ideal of surgery. We refer to the cold steel sound.

Laying aside the much-debated question of stricture as causing every case of gleet discharge, which we shall refer to in the chapters on Stricture, we will consider only those cases which, upon an examination, we find free from stricture.

Patient complains of a gleet discharge, most noticeable in the morning upon rising; shirt-flap somewhat discolored in several small spots. After a little wine or beer or sexual congress, he notices the next day that he has an exaggerated discharge filled with pus, which runs for a few days with but little pain, and then assumes the former gleet character. He says he has had gonorrhœa once or several times before—is not entirely sure whether it has ever ceased discharging. Or, he relates that after an outing of some weeks—where he has lived well and taken outdoor daily exercise—he became, as he supposed, entirely well; and he resolved to keep from women and to drink nothing. A few weeks of his usual business life, with a few glasses of liquor or wine, however, develop the fact that he is by no means cured, although he has not been with women—otherwise he would have been led to believe that he had contracted an entirely new attack. He has never had bladder irritability, nor a swollen epididymis.

The patient is asked to urinate into an absolutely clean glass beaker, and before the sediment has had time to settle, when the utensil is held to the light, you will notice a number of fine, thin, long flocculi swimming in the urine. There may be a small quantity of albumin in the urine, but you will discover by your

microscope that this is due to the numerous pus-cells which it contains.

And now for an examination of the patient. If the quantity of discharge is great, by no means pass an instrument—thus avoiding the risk of infecting the deeper portions of the urethra, setting up an epididymitis or a gonorrhœal cystitis, for the pus from these late cases is very infectious.

You should in such a condition give either the “mist. hyoscyami,” until the pain upon urinating has entirely ceased, and then the “mist. Lafayette” or the capsules of oleum santal until nearly every trace of purulent discharge has ceased.

The patient *should always urinate at the time of his visit*, and for further precaution the anterior portion of the canal should be washed out with warm water in the following manner: A Mercier catheter-coudé, about No. 16 to No. 20 French, should be attached to a short piece of rubber tubing, and this in turn to the nozzle of a large hard-rubber syringe, capable of holding three and a half to four ounces. The syringe and catheter having been filled with warm water, the latter being lubricated with glycerin is passed into the urethra until the recurved point of the catheter is within a half-inch of the peno-scrotal junction—which can be easily determined by holding the finger on the canal just in front of the scrotum. The current of warm water finding its passage blocked by the spasmodic contractions of the anterior sphincter (compressor urethræ) flows outward through the urethra, which is not completely filled by the instrument, and dribbles down the projecting part of the catheter into a basin—held by the patient, thus leaving

both of the operator's hands free to manage the syringe and hold the instrument in place.

By this manœuvre we have cleansed the urethra entirely, and may now proceed to examine further.

Attention must here be called to the meatus. Many cases of chronic anterior urethritis are cured by simply enlarging this opening. One has seen hundreds of cases where the external aperture would only admit of the smallest-sized bougie, and where this abnormal condition had given rise to true vesical irritation from damming back the flow of urine. So small a meatus will also restrain the free flow of the pus, so that the canal cannot be washed out clean or an examining instrument passed within. In order to relieve such a condition a wad of absorbent cotton is wrapped about the end of a wooden toothpick, dipped in a 10 per cent. solution of cocaine hydrochlorate, and gently inserted a half-inch into the urethra, while a second piece of cotton with the local anæsthetic is placed over the portion of the glans to be incised. When the parts are sufficiently numbed, use a straight blunt-pointed bistoury, and taking the parts between the thumb and forefinger, cut *downward* toward the floor of the canal through the little bridle of tissue—never backward into the substance of the glans penis—thus making an opening sufficient to pass a No. 32 French sound, as the parts will contract down to No. 29 or No. 30 French. This is sufficient in most cases to cure the trouble and to enable the stream of urine to flow with force and precision.

We should examine for stricture first by means of the Otis urethrometer, or bougie-à-boule sounds, passing the bulb of the former, closed, to the bulbous portion of the urethra; then, screwing the indicator to No. 30 French,

gently withdraw the instrument. If you find some portions of the urethra smaller than at the bulb (where the calibre is No. 30 French), and especially at or near the meatus, do not jump to the conclusion that stricture is the cause of the gleet you have to deal with. We shall see in another chapter that Nature did not make the human urethra like a tin pipe with an even calibre throughout, but on account of its adaptation to special purposes, its structure is more yielding at one place than at others.

If you prefer the bougie-à-boule, commence with the largest instrument that will pass through the normal meatus, and test from below forward. When either of these instruments is passed the patient will complain of a smarting or tingling pain at certain points of the canal, which should be noted in your book or upon a chart kept for that purpose. Stricture not having been encountered, we pause to ask, What are these painful points? Very evidently they are small ulcers, granular spots, or inflamed follicles, which secrete pus and are always tender. And does this not suggest a sure, safe, and effectual means of cure?

Undoubtedly there are a few cases, in this condition of chronic anterior urethritis, in which forcible (four feet elevation) injections of warm water, with or without the bichloride of mercury solution, 1 : 30,000 or 1 : 40,000, or the right proportion of nitrate of silver injections, from one-eighth to one-fourth grain to the ounce, will accomplish a favorable result; in these, normal conditions must also be established, including the freeing of the meatus if too close, establishing a faultless condition of the urine and a hygienic state of health. But the majority of cases will need to be treated by a more

Or,

R.—Argenti nitras grs. i-ii.
 Aquæ ℥iv. M.

Or,

R.—Sol. potass. permanganas 1 : 500 to 1 : 300.

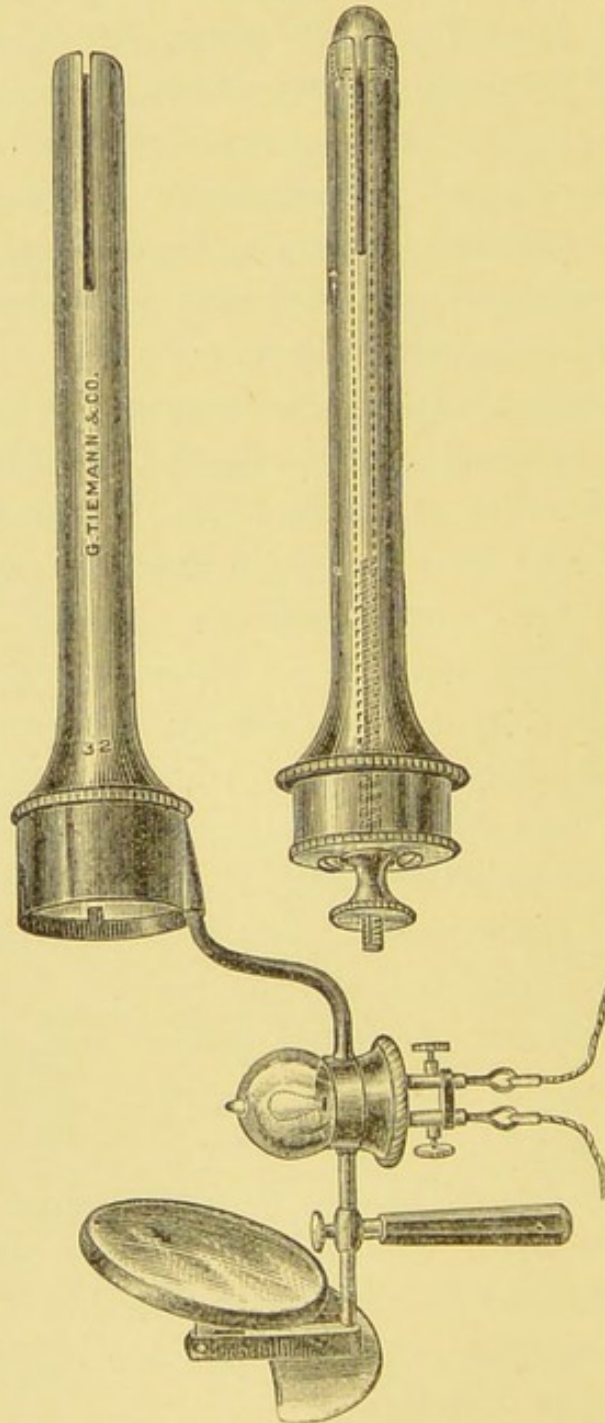
This treatment is to be repeated every other day.

We should not forget, however, that there is yet a condition of the urethra that none of these methods will suffice to cure; *i. e.*, that known as “granular urethra,” or “granular spots,” which are in fact nothing more than small ulcerations occurring in the urethral mucous membrane, irritated small follicles or tender exuberant granulations filling such places.

The endoscope. It will be necessary to use an endoscopic tube to treat such conditions, since the day has long passed when anybody, with a few choice prescriptions culled here and there from the journals, and a glass syringe, would consider himself completely equipped to treat any and all cases of gonorrhœa. A word, therefore, upon the endoscope will not be out of place, the use of this instrument not having yet become universally well known. And, indeed, until the days of incandescent electric lights, the use of the endoscopic tube was of little value. The best of artificial lights served only to light dimly the inside of the urethra. Leiter, of Vienna, perfected earlier designs, and the usual instrument, although expensive and somewhat clumsy and heavy, is a good one, if the battery is perfect—but the *perfect* battery is yet to be invented. If your current holds good for a few moments and your focus is right, the interior of the urethra may be well seen as the mucous membrane pouches over the end of your tube upon withdrawal.

My friend, Dr. William K. Otis, has, however, invented an endoscope which greatly simplifies the old instrument. The cut here presented of his endoscope explains itself. (Fig. 4.) Through this tube may be

FIG. 4.



The Otis endoscope.

applied solutions of nitrate of silver, if desired to be very strong; the solid stick fused upon an applicator or probe, or solutions of sulphate of copper upon pieces of cotton.

If one can afford the pretty plaything—the endoscope—the effect is certainly very taking. The glistening tubes, with reflectors, lamp, lenses, and long lines of bright covered wires, as well as the sensational idea of a light being shed inside the body, has a great moral effect, and is, no doubt, calculated to do the practitioner no harm, if it does not do the patient very much good. There are cases that may be cured by this means only; but much harm, on the contrary, may be done by constantly or daily endoscoping the urethra.

Remember that good hygiene, tonic mixtures, a trip to mountain or seashore, with change of air and removal from the temptations of the city, suffice to place many cases upon the high road to recovery.

At the expense of being tautological, one must again insist upon conservative measures in the treatment of the urethra. Too frequent or too strong applications to the mucous membrane are greatly to be deprecated. And gentleness, lightness of touch, and good sound reasoning are to be used with every case. The practitioner who disregards routine treatment and makes each case a special study, adopting in an intelligent manner a few principles which he knows thoroughly, is the one who will be successful in his treatment.

CHAPTER VI.

A REITERATION : SYNOPSIS OF TREATMENT.

MY own experience as a student has taught me the value of books suggesting a positive line of treatment in each variety of cases. The young practitioner often looks in vain for definite information in detail as to how he shall proceed—since experience has not taught nor practice impressed upon him the routine or the value of certain modes of treatment. A *résumé* of the foregoing will, therefore, serve to fix more clearly in the reader's mind the treatment advocated.

Chronic urethritis anterior, then, may be summed up as constituting a chronic inflammation in and upon the penile portion of the urethra.

It is diagnosticated by a history of previous claps, or by the long duration and subsequent exacerbations of a single clap.

It is characterized by the appearance of a purulent discharge in two to three days after connection, or after a spree. The discharge is attended with little ardor urinæ, and quickly fades into the muco-purulent stage again. The urine contains flocculi of the long, stringy order, with pus and some mucus. Epididymitis and cystitis are not complications of the condition.

The pathological condition is as follows: Certain spots on the anterior urethral mucous membrane are still found not covered with epithelium, and these spots still

secrete pus. Also, instead of the surface epithelium alone being affected, as in acute urethritis, the whole thickness of the mucous membrane down to the musculature has been invaded by the process of inflammation or the herds of cocci. Therefore it will not suffice to heal the surface alone, since underlying tissues are still supplying latent sources of disease and abnormal conditions still persist; certain of the glands and follicles are chronically inflamed, holding pus in their deeper portion, or they may be exuberant and above the surface of the surrounding mucous membrane.

The meatus is to be cleared to take a No. 30 French sound with ease. The patient must be free from discharge, and is to urinate before any instrument is ever passed. Examine for stricture by means of the Otis urethrometer or the bougie-à-boule, and note tender points.

We must now bring the lumen of the canal, swollen by inflammatory products, to a proper calibre—iron out, as it were, the closed crypts, to liberate the retained contents of the follicles, to tone up the diseased urethral mucous membrane, to free the œdematous muscular covering from its sodden contents, and to return all the deeper as well as the superficial portions of the structure to a normal condition. And how shall this be accomplished but by a cold steel sound? In many cases our experience teaches us that this is all that is necessary to accomplish a complete cure.

The sound-cure may be described as the daily or thrice weekly passage of a heavy, slightly conical steel sound, which should lie in the canal for a few moments; commencing with the smaller Nos. we very carefully increase the size every day, or every other day, until eventually reaching No. 29 French.

We shall find that the majority of cases, however, need, beside the passage of a sound, local medication, in weak or in concentrated solutions as the exigencies of the case may demand, in bulk injections with the Mercier catheter, as before mentioned, or by the deep irrigation method of Ultzmann, with special instruments to be hereafter mentioned. By these means the seat of most frequent selection, namely, the "bulb," is reached. The favorite solutions are as follows :

I.

R.—Alum crudi }
 Zinci sulph. } āā 2.00 = grs. xxx.
 Acidi carbol. }
 Aquæ destil. 500.00 = $\bar{3}$ xvjss. M.

Sig.: 1 part solution to 3 parts of warm water after passage of sound.
 If this is well borne, 1 part to 2 parts, and finally 1 to 1.
 One irrigation daily.

Or,

II.

R.—Potassii permanganas 0.01 = gr. $\frac{6}{10}$.
 Aquæ destil. 200.00 = $\bar{3}$ xvjss. M.

Sig.: Commence with 10, later 15 and 20, and lastly 30 c.c. of this solution to 200 of lukewarm water.
 One irrigation daily.

Or,

III.

R.—Argenti nitras fusi 1.00 = grs. xv.
 Aquæ destil. 500.00 = $\bar{3}$ xvjss. M.

Sig.: 1 part solution to 3 parts of warm water, later 1 to 2 parts.
 One irrigation daily.

Or,

IV.

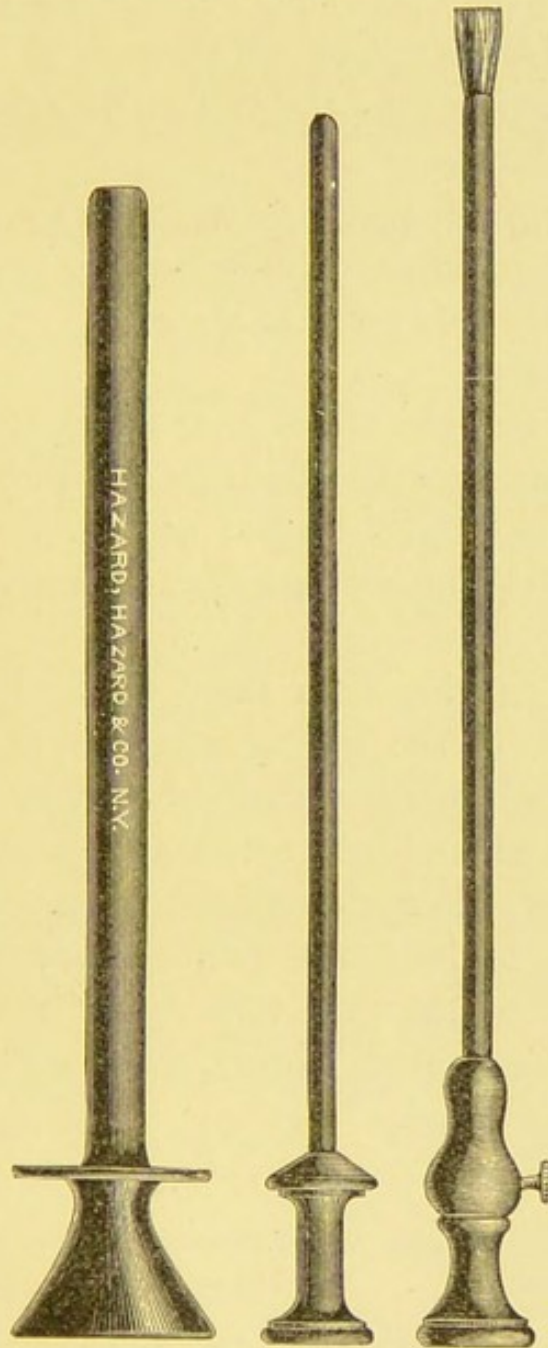
R.—Hydrargyri salicyl. }
 Potassii carbonas } āā 1.00 = grs. xv.
 Aquæ destil. 500.00 = $\bar{3}$ xvjss. M.

Sig.: 1 part to 3 parts, later 1:2, then 1:1 with warm water. These irrigations should be given once daily.

N. B.—All sounds and instruments to be lubricated with glycerin, albumin, or glycerite of starch.

In a more concentrated form, medication may be applied at local points of congestion, "granular patches,"

FIG. 5.



Ultzmann's brush apparatus.

or upon the whole of the anterior urethra, through Ultzmann's brush apparatus (Fig. 5), which consists of

a tube of hard rubber fitted with an obturator of the same material, and projecting as a rounded end a short distance beyond the tube to protect the urethra from the sharp edges of the lower end. A brush made from fine camel- or sable-hair, and fitted with a handle long enough to reach beyond the end of the tube, is used to deposit the solution.

The tube with obturator being in place and lubricated with *glycerin*, is carefully introduced to the bulb or to any particularly sore point of the canal. The obturator is then withdrawn.

Be careful to give notice to the manufacturer when the instruments are made that this cone-piece (obturator) does not fit too tightly, since suction on withdrawal may draw up the mucous membrane into the tube and severely injure it.

The brush, having been fitted to the length of the tube by means of the sliding gauge, is now dipped in the concentrated solution of silver nitrate, or any other that is preferred, and held between the first and second fingers, palmar side up, the thumb upon the top of the brush-handle, to hold the hair end firmly projected from the end of the tube now in the urethra. It is brought out by a spiral motion, which completely coats all parts of the canal.

V.

R.—Argenti nitras fusi	. 1.00 = grs. xv.	} or 1.00	M.
Aquæ destil.	. 30.00 = $\bar{3}$ j.		
		20.00	

VI.

Three per cent. copper solution.

R.—Cupri sulph.		3.00 = grs. xlv.	
Aquæ destil.		100.00 = $\bar{3}$ ij- $\bar{3}$ j.	
Acidi sulph. dil.		gtt. v.	M.

VII.

Five per cent. copper solution.

R.—Cupri sulph.		5.00 = grs. lxxv.
Aquæ destil.		100.00 = ℥iij-℥j.
Acidi sulph. dil.		gtt. v. M.

In order to save the busy practitioner the trouble and time necessary to hunt up the different procedures and solutions hereinbefore mentioned, I have grouped them together here that they may be seen at a glance. The following scheme was used by Prof. Ultzmann in treating anterior chronic urethritis:

First day. Sound No. 21. Zinc, alum, carbol., 1 : 3 lukewarm water.

Second day. Sound No. 22. Zinc, alum, carbol., 1 : 2 water.

Third day. Sound No. 23. Potass. permanganate solution [No. II.], 10 : 200 water.

Fourth day. Sound No. 24. Potass. permanganate solution [No. II.], 15 : 200 water.

Fifth day. Sound No. 25. Silver nitrate solution [No. III.], 1 : 3 water.

Sixth day. Sound No. 26. Silver nitrate solution [No. III.], 1 : 2 water.

Seventh day. Three per cent. copper solution [No. VI.], 1 : 3 water. Paint with use of tube and brush.

Eighth day. Sound No. 27. Potass. permanganate solution [No. II.], 30 : 200 water.

Ninth day. Five per cent. copper solution [No. VII.], 1 : 3 water. Paint.

Tenth day. Sound No. 28. Potass. permanganate solution [No. II.], 30 : 200 water.

Eleventh day. Argent. nitr. (2 to 5 per cent.), 1 : 2 water. Paint.

Twelfth day. Sound No. 29. Potass. permanganate solution [No. II.], 30 : 200 water.

Thirteenth day. Argent. nitr. (5 per cent.), 1 : 2. Paint.

Fourteenth day. Sound No. 30. Potass. permanganate solution [No. II.], 30 : 200 water.

If bleeding follows a certain size of sound, at the next visit it will be better to decrease one No. or pass the same size rather than use any violence in dilating the canal ; and this rule must be followed until no more bleeding occurs. Also, should great smarting or bearing-down pains follow after any séance of this treatment, or the testicles become painful, or bladder symptoms supervene, it is necessary to altogether suspend treatment until all reaction has ceased.

I have found many cases where, after the above treatment, the discharge was greatly increased both in amount and purulence for the first few weeks. I treat these cases in the most gentle manner possible, giving alkaline mixtures or the capsules of the oleum santal (Parke, Davis & Co.) until the discharge has almost ceased, and then recommence at the very beginning—always assuring the patient of ultimate success, and explaining the causes. If the patient is not warned beforehand of these possible occurrences you may lose both the confidence and the patronage of your patient.

CHAPTER VII.

CHRONIC GONORRHOEA : URETHRITIS POSTERIOR OR ANTERO-POSTERIOR.

WE now come to the condition of chronic posterior urethritis, or this condition complicated with the anterior chronic variety as antero-posterior urethritis chronic.

As heretofore explained, the *posterior division* of the urethra extends from the triangular ligament to the bladder, comprising the membranous and the prostatic portions of the urethra. These different portions or divisions vary in calibre, so that a cast of the posterior portion of the urethra looks like a string of long beads—some larger, some smaller. In this portion also are found important structures appertaining to the generative function of the penis—Cowper's glands opening into the membranous portion, and the ejaculatory ducts from the seminal vesicles through the sinus pocularis into the prostatic urethra; then, also, in contiguous connection, the highly sensitive mucous membrane of the trigone of the urinary bladder.

Is it any wonder that virulent inflammations should complicate the disease in this deep-seated and remote region of the urethra?

What must happen when the passage of an instrument, or a column of strong injection fluid, forces the profuse, purulent and highly infective discharge of an acute gonorrhœa behind the triangular ligament? Has

not serious damage been done to this deep portion of the urethra? Undoubtedly. This inflammation may travel to the deep glands of Cowper, causing "Cowperitis," attended by severe pain and swelling in the anterior perineal region, which may require to be evacuated by incision, if rest and warm applications are not attended by resolution. Or it may occasion epididymitis, that bane of all surgeons, caused by an extension of the infection through the sinus pocularis and vas deferens to the epididymis or testicle. The pain of epididymitis or orcho-epididymitis, characterized by its throbbing and sickening sensation, at first light but soon becoming severe and agonizing, is followed by such severe suffering as to completely prostrate the strongest man, if the attack is at all complete. The epididymis (and generally the testicle as well) swells to two or three times the normal size, with the scrotum also, which is generally deep-red in color, the rugæ of the skin being nearly obliterated and the deeper tissues highly œdematous—a condition which, once seen, is never forgotten.

Strangely, at the outset of an attack of epididymitis the profuse discharge suddenly ceases, and does not reappear until resolution occurs. It is said, also, that it is then impossible to find any gonococci in the urethra.

Pathology has not yet solved the changes which take place in chronic posterior urethritis. The injudicious use of strong injections, the passage of instruments roughly or at too early a date, violent exercise, or taking cold by sitting on the cold and damp ground during the discharging continuance of a clap, are sufficient to cause the disease. No sooner do we observe the sudden diminution of the discharge—which the patient gladly hails as the end of his trouble—than we who have had ex-

perience are constrained to undeceive and warn the unhappy one, by presaging the quickly following pain and discomfort.

Is it strange that we raise the question, What becomes of the purulent discharge, which reappears at the resolution of this complication—what becomes of the gonococci, during the non-discharging period?

The Paquelin cautery-point at a white heat lightly brushed over the surface of the scrotum and the cord on the affected side offers speedy relief from pain, if not the means of rapid cure. The moral effect is enormous, and we have seen patients upon whom this method is to be practised get upon the table in the greatest pain, and step down entirely free from it, and remaining so. In view, however, of the modern ideas of germ infection, theoretically the groin and scrotum should be shaved and washed before the hot point is used, and thereafter kept scrupulously clean, since the possible abrasion of the skin may develop an ulcer, by which may enter infection. The employment of rest, suspension, the "lead and opium wash," *vide* p. 35, or equal parts of the opium and belladonna ointments, freely applied, give better results than poulticing with linseed meal or tobacco.

Symptoms. The history of a posterior chronic urethritis will resemble that of an anterior chronic in many points: its stubborn refusal to be cured by means other than those which are purely local, the periods of latent remission, the coldness and hardness of the penis, the sticky lips of the meatus, the exacerbations of discharge from excesses in venery and drink.

In addition to these symptoms, and one not found in the anterior chronic cases, is the feeling of fulness and

heat in the region of the rectum just within the anus, "feeling like a hot coal" whenever the patient rides hard, walks far, exercises violently, or indulges in venery. With this feeling may come a state of irritability of the bladder, which may amount to a true gonorrhœal cystitis, with all its agonizing consequences.

If we keep these facts in mind we shall instinctively turn to the examination of the urine—which has so many characteristic signs for the genito-urinary surgeon—for a confirmation of our diagnosis. We do not now propose to go into a general physiological description of the urine, but to examine only such conditions of morbid urine as will be likely to assist us in making our present diagnosis.

Cloudy urine. The clinical significance of cloudy urine may be summed up in a few words. Normal urine is clear, and only after some time does it deposit a sediment, which accumulates in a cloudy film near the bottom of the glass. Microscopically, one finds some single flat epithelial cells or single lymphoid cells.

In disease of the kidney or the genito-urinary tract the urine is often cloudy from the secretion of the catarrhal discharges. It may also be caused by abnormal quantities of certain chemical constituents, occasioning loss of the solubility of the normal mixture, or by a spontaneous alkalinity causing such elements to precipitate as are held in solution by an acid mixture. Here one's wisdom is taxed to know the cause of the cloudiness. This in a general way may be quickly known by the following scheme, which of course is not claimed to be unfailing, but which is as nearly correct, as practical, and as convenient as any that I know of.

CLOUDINESS OF URINE (SEDIMENT).¹

If upon gently heating urine in a test-tube—

It disappears.	It is increased.			Remains unchanged even upon addition of acetic acid.
The cloudiness consists of acid salts of urates.	The cloudiness arises either from carbonates or earthy phosphates, or from purulent catarrhal secretion.			The cloudiness arises from slightly increased mucus, or from spermatozoa, or from bacteria.
On addition of one to two drops of acetic acid :				
Disappears with evolution of gas Carbonates.	Disappears without evolution of gas. Phosphates.	Remains unchanged. Pus in urine.		

Our brief examination has given us some insight into the condition of the urine, which is to be examined further, and by this simple test we have ascertained whether such abnormal urine irritates the genito-urinary tract, and if it contains albumin. If, under the last condition supposed, upon the addition of acetic acid, with heat, the cloudiness remains unchanged, we have a condition where there is either pus or albumin ; and as the lymphoid cells are composed of protoplasmic albumin, the diagnosis, as between albuminuria, or pus from the urinary tract, must be determined by the microscope.

Upon page 46 we noticed, as observed with the microscope, two distinct varieties of threads or flocculi ; of these the "long" was described as belonging particularly and entirely to the anterior form of urethritis, while the "short," "tack," or "hob-nailed" form—from the rolling up of one end of a very long thread or the cast of a prostatic follicle, or both, according with any pet theory, will be found in this variety of urethritis as well. These are seen when the patient

¹ Table from Ultzmann,

urinates into a clean glass, and appear in one or both of the specimens—for *two* specimens are usually preferred. The careful use of the microscope in the examination of urine will detect many forms of disease: pus from the urinary tract in general, cells from the urethra, different forms of epithelium from the bladder or kidneys, casts, blood, etc.—indeed, a host of information rewards such search.

Having discovered pus or blood, or simply the flocculi in the urine, we should now make our examination of the parts, first by manual touch, when we shall discover the state of the penis—cold, hard, or gristly; discharges—profuse or slight. Again, the stained shirt-flap gives us often valuable tell-tale information as to an unnoticed discharge. Hardness of the epididymis denotes former epididymitis or orcho-epididymitis. The condition of the lymphatics in the groin should always engage our attention. The question of the irritability of the bladder, either present or long past, will add the apex to our pinnacle of a history.

Let us see, then, the complete clinical picture: One or more acute attacks of gonorrhœa—one lasting for an unusual length of time through bad management, neglected health, or from having been untreated. An epididymitis, Cowperitis, or prostatitis complicated the case; if the latter, a more or less violent attack of cystitis which was stubborn to cure, lasted some weeks and caused great pain and suffering, and the patient remembers when he could not hear water running or think of urinating for a moment without having to hurry the penis out of his trousers in double time to prevent wetting his clothes, so great was the reflex sensibility of the bladder. After this the discharges are

now seemingly well, again sticky, or acute, according to mode of life or state of health—an acute diarrhoea sometimes bringing on an undeserved gonorrhœal flow, resembling an acute attack of gonorrhœa from the fierceness of the discharge and the pain. Medicine, quacks, patent injections—in fact, everything except the right treatment—fails entirely to cure these cases. Examination of the urine as above recommended will probably show pus, flocculi, possibly blood, and bladder epithelium if the attack of cystitis has been recent.

We should now proceed to investigate the urethral canal. For this purpose a smooth, short-curve, olive-pointed steel sound should be used. This instrument, warmed and smeared with vaselin or albolene—as being better than sweet oil, since they do not become rancid—is to be introduced into the urethra, provided the patient has only a slight discharge, or none at all, and the extra precaution has been taken of his having urinated just previous to the sounding process.

If No. 27 French be passed to the bladder, while No. 28 or 29 is passed to the bulb, we may say that stricture is not the cause of the discharge.

No stricture being present, we proceed to the formation of a diagnosis of chronic posterior urethritis.

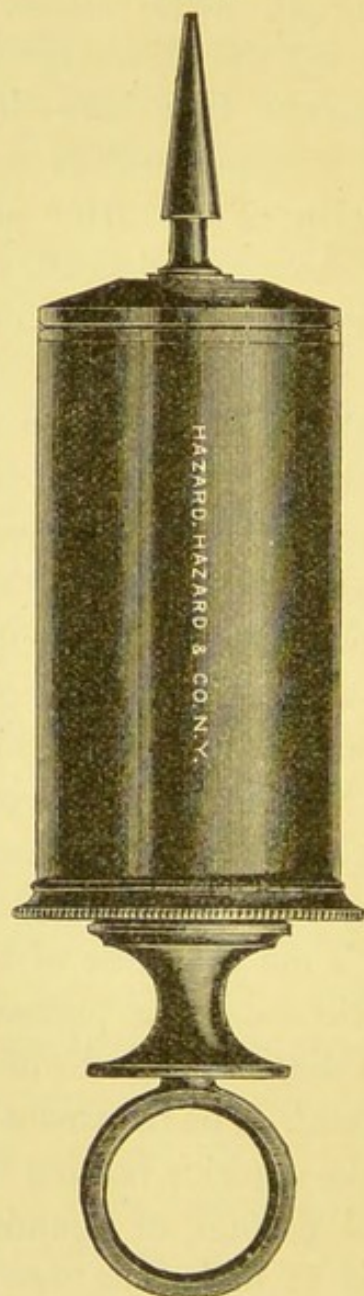
Treatment. The treatment of this disease is not unlike that of the anterior portion so far as irrigation and the occasional passage of sounds is concerned. First, the patient is to make his water into a clean glass, completely emptying the bladder, then the prostatic catheter of Ultzmann (Fig. 6), with the rubber hose and four-ounce syringe, is to be filled with solution No. I. or II. (page 58), warmed, taking care to fill the catheter and tube so as to exclude the air—which would do no par-

ticular harm in the bladder, but is sometimes very disagreeable to the patient, who complains that he "breaks

FIG. 6.



FIG. 7.



Catheter of silver, with very short Thompson curve. Tip perforated with a number of small holes. Length, from tip to plate, six and a quarter inches. Above is a rubber hose, at end of which is a hard rubber piece which exactly fits the nozzle of the hard rubber syringe, which should hold four ounces. (A good syringe is one of the hardest instruments to find in America, but I can especially recommend Messrs. H. H. & Co.'s instruments when extra packed.)

wind from his penis" when this occurs. The instrument being lubricated with glycerite of starch or glycerin, the tube is then introduced to the isthmus of the canal (compressor urethræ muscle). The proper manœuvre in introducing it is as follows: The short tube is introduced exactly like a sound, being held parallel to the body until the beak passes to the triangular ligament; it is then bent forward, but may encounter some resistance to entering the membranous urethra by reason of spasm of the detrusor muscle; carefully hold the end of the catheter against the muscle until the sphincter relaxes, and you will feel the end pass the obstruction. As this instrument is shorter than a catheter or steel sound, when the point of the instrument is in position the plate on the top will press somewhat the head of the penis; the forefinger of the left hand is used to steady the plate of the catheter on the head of the penis, the first two fingers of the right hand grasping the rim of the syringe, while the thumb drives the piston slowly and evenly home.

Mention may as well be here made of a condition found in some urethræ, which may exceedingly puzzle a young practitioner when encountering it, but which will only cause the experienced to smile as they recall their first efforts. There are some urethræ which have a distinct pocket *below* the opening into the triangular ligament into the bulb. If account is not taken of this fact, no matter how skilfully the sound may have been introduced to this point, the end will never pass further until it has been lifted to the opening in the ligament, which is *above*. Remember, therefore, if your catheter or sound springs back upon attempting to pass it into the bladder after having reached the peno-scrotal junction, that by simply lifting the instrument a little, the end will find

the opening into the ligament and slip easily onward. I have heard very many students, as well as post-graduates, declare stricture to be present in the case they were examining (they were not sure whether it was *spasmodic* or organic), and that the sound would not go further, who were greatly surprised to see it pass gently on to the bladder in more experienced hands.

If the operation is rightly done there is absolutely no pain, and, beyond an indescribable feeling in the

FIG. 8.

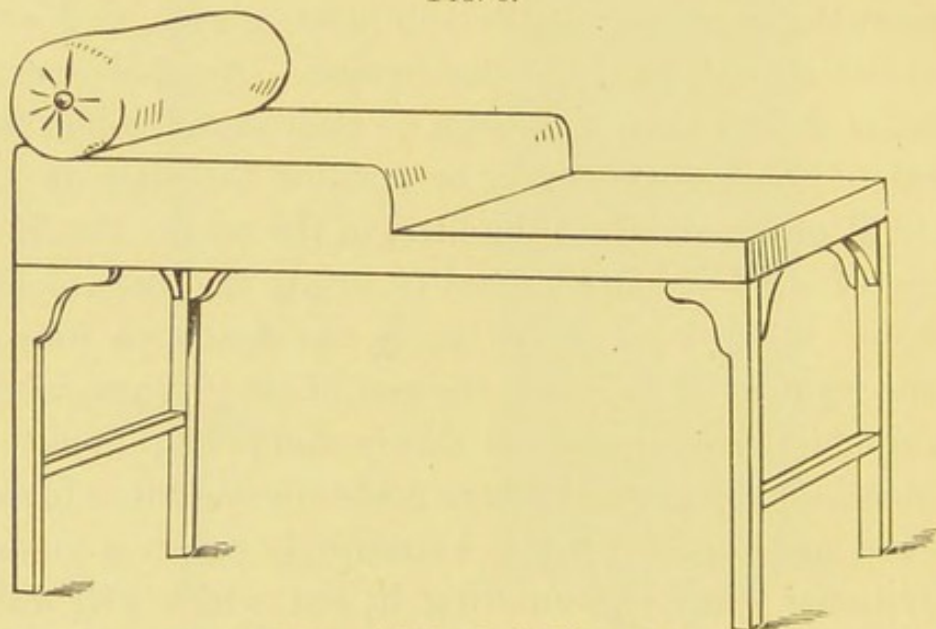


Table used by Prof. Ultzmann.

bladder which is not at all painful, the patient experiences nothing. All cases are not so easily managed, however, as the above might lead one to imagine, and only practice will make one perfect. Prof. Ultzmann had in his clinic at Vienna a table so constructed that its outline (Fig. 8) lifted the patient's pelvis in such a way that a big belly or enlarged prostate were thrown into the best position for the introduction of a sound. At his private office, however, he used a hard hair-cloth sofa, with a thin, movable cushion to place under the

patient's buttocks. I have found this "wrinkle" of very great help many times in introducing the short catheter or sound.

There is yet another condition to be guarded against which may cause the young practitioner much confusion. If the point of the catheter has not passed the compressor urethræ muscle, and the plate of the instrument does not press well into the head of the penis, the fluid, instead of being injected into the bladder, will return through the meatus, flow over the patient's thighs and wet his linen. To guard against this accident, you should feel the yielding of the muscles as the tip of the instrument passes this point of the canal; the cap pressed down on the penis, the piston of the syringe will then fall almost of its own weight; there should be no driving force necessary. At the same time watch carefully for any return from the meatus. If the calibre of the canal is very large, as is sometimes the case, and its surface does not grasp the tube tightly enough to prevent the return flow, the size of the instrument should be increased.

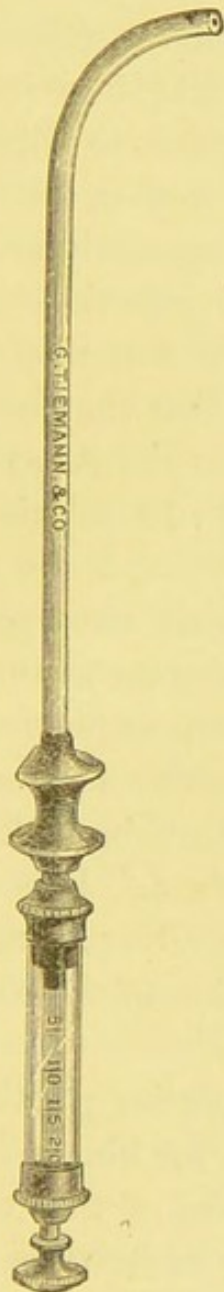
The bladder, having been filled with the one-hundred-gramme mixture which has passed over the diseased surfaces, is now to be emptied by urination. Sometimes it happens that both patient and doctor are much alarmed, when, after repeated attempts, it is found impossible to empty the bladder of the fluid injected, on account of the spasm of the inhibitory muscles. But even should the well-known physiological excitant of dribbling and splashing water or holding the finger-tips in water fail, there need be no apprehension of harm; after the patient has walked away from the office, he will relieve himself at the nearest convenient place.

If anterior chronic urethritis does not complicate these cases, there is no advantage in using a sound except at occasional intervals. After several injections have been given, the zinc, alum, and carbolic solution must be changed for that of potassium permanganate and the other solutions fully explained on pages 58-62.

There yet remains a remedy held by surgeons as of the highest power for good, viz., the stronger solutions of nitrate of silver, locally applied to the prostatic urethra by means of Ultzmann's deep urethral injector. This instrument (Fig. 9) consists of a capillary silver tube, having a minute opening at the end of the curve, and connecting at the top, by a tight joint, with a well-made rubber and glass syringe, marked, from the top down, in minims. As a rule, the silver tube holds an average of nine drops. Therefore, when the solution, drawn into the syringe, is pushed down to "9," we shall expect the next drop to appear at the orifice. (As nitrate of silver solutions are so disagreeable to handle, and stain almost everything they touch, it is well to describe thus minutely what might otherwise be considered trifling.) When the piston is further pressed down, by watching the scale on the glass we may deposit as many drops in the prostatic urethra as we desire. This silver instrument, as originally devised by Prof. Ultzmann, has been improved by Dr. E. L. Keyes, of New York, by the addition of two wing-like blades on either side, which help to steady the instrument so that it may be used by one hand, as is intended. This "ätzung"—etching—or cauterizing of the prostate is of no recent date: fifty years ago many instruments were devised for the application of silver nitrate to the prostatic urethra.

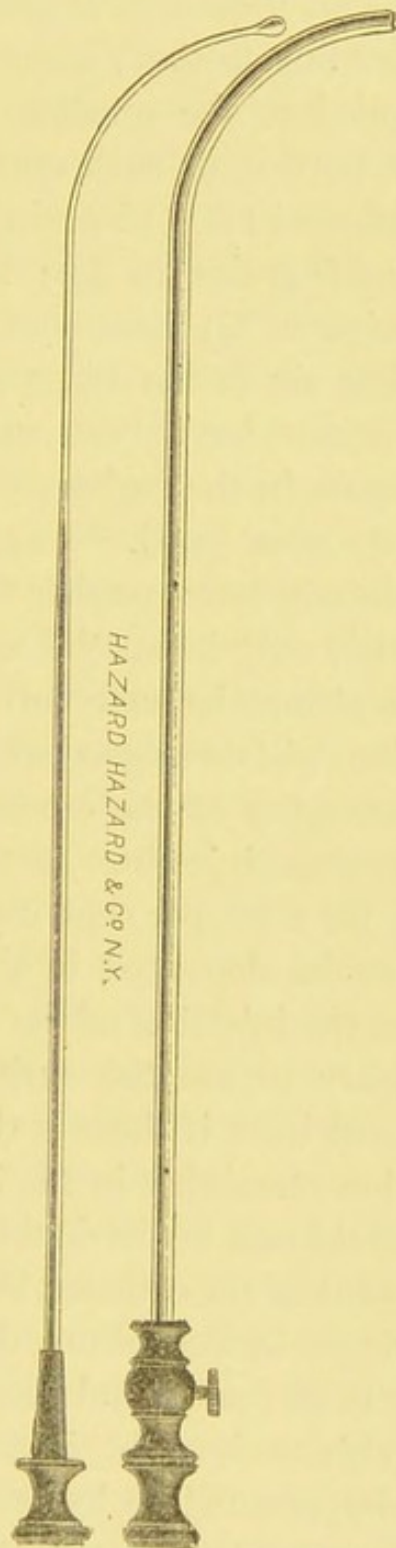
From the hard and unyielding character of the walls of the prostatic portion of the canal and the substance

FIG. 9.



Ultzmann's deep urethral injector.

FIG. 10.



Dittel's "porte remède."

of the gland, inflammation, which is almost necessarily chronic from the first, is extremely difficult to reduce ; and also, as would be expected in this situation, stricture is rare—if, indeed, ever present.

According to the Vienna school, nitrate of silver may be applied to the prostatic urethra (but not to the pendulous portion in such concentration) in the following strengths—1 : 30 (15 grains to $\mathfrak{z}\text{j}$) ; 1 : 20 (15 grains to $\mathfrak{z}\text{v}$ or 24 grains to $\mathfrak{z}\text{j}$) ; 1 : 10 (15 grains to $\mathfrak{z}\text{ijss}$ or 48 grains to $\mathfrak{z}\text{j}$), commencing with the weaker solution, injecting six to ten drops at each sitting, until several applications have been made. These injections give great pain in the region of the perineum, but they likewise do great good. I am persuaded that the German urethra will bear rougher treatment than the American, and that only in special cases will a 1 : 10 solution of silver nitrate be well borne ; the 1 : 20, or 5 per cent. solution, will do as good work with us as the more powerful strengths of the other side. An elegant method of giving these injections is to use two deep catheters, one being for a 10 per cent. solution of cocaine hydrochlorate, to be deposited in the deep urethra immediately before the injection of the cauterizing fluid. It is quite necessary to use *two* syringes, as the silver nitrate is rendered inert if there is the least portion of the cocaine solution remaining in the instrument.

Should one be in doubt as to the precise position of the point of the catheter, it will be well for him to insert one finger in the rectum, detect the point of the instrument in the canal, and then, advancing or receding until the position is right, inject ; closing the entrance to the bladder, meanwhile, by pressure forward upon the canal.

Many readers of these pages have probably ere this

asked themselves the question, Do these irrigations of the bladder, or deep injections of the prostate, ever leave any permanent injuries in the bladder or prostate? Has the enthusiasm of so many vaunted cures been tempered adversely by the results made manifest by time? We believe that a period of ten years has not found a single recorded permanent injury from the Vienna methods, either as to stricture of the prostate or disease of the bladder; we can assure the patient of ultimate success without any bad results. In the large majority of instances cures can be effected, by these methods, of cases which have become chronic in the deep urethra, and have been treated unsuccessfully by all other means—a month or two of the treatment described above being sufficient to cure cases of ten to fifteen years' standing.

In addition to the methods already detailed, one may use deep cauterization and medications by means of the *porte remède* of Dittel (Fig. 10), which is a tube with a flexible obturator, shaped like a blunt-curved sound, into which is introduced a suppository, or pencil, of cocoa butter, containing tannic acid, sulphate of zinc, alum, or freshly prepared nitrate of silver of varying strengths. The instrument is then made to lie in the prostate, the charge being pushed home by the stylet, and the patient is to lie down for twenty minutes to a half-hour until the cocoa butter has melted.

Having now detailed all the methods for the treatment of chronic posterior urethritis, the thought occurs, What may we call a cure? Do we, in reality, absolutely cure or cause to disappear all discharge? Do we relieve pain? Do bladder symptoms cease? So far as pain is concerned, I think it ceases entirely if the patient observes certain rules of life for a length of time. The

purulent discharge is absolutely stopped ; the patient is free from the annoyance, if he does not walk or exercise too vigorously until treatment is completed. A little irritability of the bladder remains for months, only to disappear by time. The meatus may be moist for some months, or perhaps years, but even hard drinking, carousing, violent exercise, etc., fail to renew the purulent state of the flow. Marriage or a change of climate suffices to entirely cure even this pathological feature. Undoubtedly, marriage puts the penis to physiological exercise which benefits the morbid conditions, so that in a few years there is no discharge whatever.

CHAPTER VIII.

URETHRAL STRICTURE: PSEUDO-STRICTURES DISCUSSED.

IN our treatment of the subject of stricture of the male urethra, the condition, caused by inflammation or traumatism, accompanied by the formation of new connective tissue, will alone be fully described. We have seen in the foregoing pages that every gleet is not caused by stricture. We have also become acquainted with stages of disease in the urethra where the lumen of the canal is encroached upon enough to prevent the free passage of urine; this can occur as

Acute urethral inflammation. Under this first heading are those acute cases of inflammation caused primarily by gonorrhœa, or by chemical irritants, where the mucous membrane and deeper portions of the urethra are so swollen that the urine is passed with great difficulty. In such cases we now know that the infection does not remain upon the surface of the mucous membrane, but attacks the deeper portions down to the submucous connective tissue, occasioning cell-infiltration and œdematous swelling. "If, now, this process is of long standing—*chronic urethral inflammation*—we shall, upon examining the urethra, find that to the touch the canal in its whole extent is thickened, hard, and infiltrated; its muscle sodden from œdema, thus losing its elasticity, and it is converted into a stiff and rigid tube, whose lumen is encroached upon."

The above sentence in quotation-marks is from the

pen of the late Prof. Ultzmann. That author was well acquainted with the teachings of Prof. Otis, of New York, and in order to define to his American students (who frequently consulted him) his theories of stricture, he described the above as constituting the "stricture of large calibre—Otis." As an admirer of both masters, one is glad to accept this pathology as the cause of those encroachments upon the lumen of the urethral canal that are sometimes called "*stricture* of large calibre." The word stricture is misleading to students, and conveys to their minds the idea of a callous mass of hard connective tissue which only cutting or persistent dilatation will cure. Exception is taken to the *term* alone, without regard to what condition Prof. Otis might have had in mind when he described that variety of "stricture" that has occasioned debate.

At the expense of repetition, attention must again be called to this class of chronic cases, asking particular notice of the method of handling chronic anterior urethritis where the *sound cure*, and *not dilatation*, is the important element in our treatment. There is no doubt such a nice shade of distinction between the two processes—stricture of large calibre (Otis), and chronic anterior urethritis—that we may be taken to task as to what is "chronic urethritis" and what "stricture." But if the reader will grant indulgence until that portion of the subject is reached where a comparative diagnosis between the two is to be made, there is no doubt that the bearings of the perhaps seemingly useless controversy as to what are large and what are small strictures will be better understood.

Having, therefore, taken for granted that for the present we have taken leave of two varieties of false

strictures, we have yet to mention the last of this class, viz., spasmodic *so called stricture*.

Anyone who has ever had any experience with urethral surgery knows how often patients are unable to make water in a second party's presence, or even when in the same room with another. Put these persons in a closet by themselves, or introduce a catheter, and the water gushes forth—showing that the reflex nervous action had closed those sphincters that guard against the involuntary passage of urine.

Again, upon passing a cold sound its progress will suddenly be stopped by a barrier which is seemingly impassable. By holding the face of the sound against the muscular spasm, and using a little patience, with gentle pressure, the obstacle will quickly be overcome, and a full-sized instrument pass easily into the bladder.

Perhaps it would be best to include in our list of pseudo-strictures, tumors which by pressure may encroach upon the patency of the urethral canal. These, however, can be but barely alluded to, and then dismissed as being foreign to our subject.

The anatomical structure and division of the male urethra causes us to guard our definition of the word "stricture," and it is essential to make correct logical premises before we draw a definite and true conclusion. "Who shall decide when doctors disagree," is an old saw, which is probably more appropriate in our nineteenth century than in the mediæval days which gave origin to the saying.

Anatomy of the male urethra. From the varying lengths and circumferences of the male organ of generation, the position of the bladder and the size of the bony framework of the pelvis, it is pretty difficult to

make a positive and distinct measurement for the calibre and length of the urethra. In a general way, we may state that the male urethra is from eight to nine inches in length, anatomically divided for convenience into—a pendulous or spongy portion, extending from the meatus to the bulb; a bulbous portion, extending to the membranous urethra, which starting from under the triangular ligament joins the prostatic portion entirely surrounded by the prostate gland and connecting with the bladder. Prof. R. W. Taylor, of the Vanderbilt Clinic, described, in a lecture given before the class, the average calibre of the male urethra to be as follows: Spongy portion, 30 Fr.; bulbous, 33 Fr.; membranous, 27 Fr.; prostatic urethra, 33 Fr. And here we may plainly see that Nature has not formed the urethra like a garden hose, a straight simple tube, but by various modifications, the reasons for some of which are understood and those for others are not as yet known, has made it a physiological duct adapted to the double purpose of conveying urine from the bladder and projecting it to a specific spot at a distance, and of depositing semen in the vicinity of the cervix uteri.

Thus, the contraction of the tube at the meatus is not less necessary than the contracted brass nozzle which directs the water from our hose. The enlarged bulb is needed to receive the contents of the bladder in order that friction may not too strongly impede the flow of urine when passing around the curve at the pubic arch. The lessened size of the membranous portion allows a quicker result of the muscular contraction for the action of the inhibitory muscles. The structure of the tube with its collapsing walls surrounded by the muscles which accelerate the passage of fluids, and the

complex system of nerves and bloodvessels, serve to the best possible advantage the uses for which they were designed. We find, then, that there are excellent anatomical reasons why the canal should not be equally dilatable throughout the whole of its course.

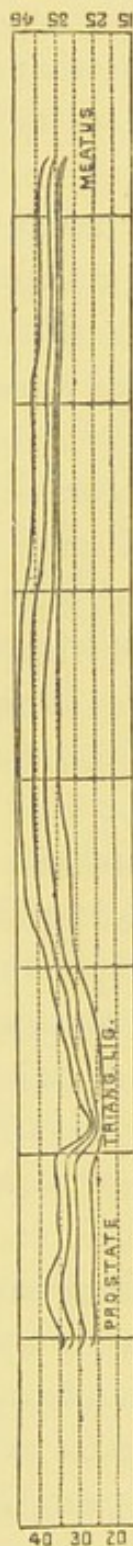
During the hunt for material for this little manual, a reprint from the *New York Medical Journal* for April 12, 1890, by R. W. Stewart, M.D., M.R.C.S., Pittsburg, Pa., came under my notice. The article is entitled "Some Observations on Stricture of the Male Urethra." I read and re-read this clever little contribution with great care and much benefit, for in some of its parts it supplies me with definite language with which to clothe some ideas that I have long held. With Dr. Stewart's permission, extracts from his article are given.

In speaking upon the subject of urethral disease in connection with urethral stricture, he says :

"Perhaps the best definition of urethral stricture yet given is that of Sir Charles Bell, who, recognizing the urethra as a closed canal, except during urination, defines stricture as 'any loss of dilatability of the urethra.' This brings up the question, What may we consider as the normal dilatability of the urethra? or, in other words, What is the shape of the urethral canal under dilatation?

"Under normal circumstances the urethra is dilated during every act of urination, but the amount of dilatation is slight compared with what the urethra is capable of, as anyone will admit who will observe the size of a healthy individual's stream of urine, and then compare that with the size of an instrument that will fill his urethra comfortably. It may be said that the healthy urethra is never distended by the stream of urine, even

FIG. 11.



Tracings indicating urethral distention. (DR. STEWART.)

up to the size of a sound capable of slipping through the urethra with its own weight. Few facts are better established than that the dilatability of the urethra varies in different portions of its course, and I have had reason to observe that the relative dilatability of different urethræ is not always uniform. By a mechanical contrivance, which I have called a urethrograph, I have made a series of observations of the healthy urethra, with a view to ascertain the relative dilatability of its various portions under varying degrees of distention, and, as already mentioned, all urethræ do not dilate alike, so that only an approximate standard can be given of its proper dilatability.

“In order to illustrate this subject I have selected Fig. [11], consisting of four diagrams, taken with the urethrograph from the same urethra, each diagram from below upward representing the urethral canal under an increased degree of distention. It will be profitable to analyze these diagrams, but, before doing so, it may be well to state that the longitudinal lines represent millimetres and the transverse lines inches. It will be observed that the lowest line, which represents the least degree of distention of the urethra, is tolerably uniform, indicating that the urethra under this amount of distention approximates in shape to a uniform canal. As the degree of distention increases, as shown

in the preceding diagrams, the urethra becomes correspondingly irregular in its outline, and, instead of an approximately uniform canal, there are now well-marked contractions and dilatations even under an amount of distention certainly not greater than is constantly exerted in the passage of urethral instruments. It will be noticed that in the descending scale of distention of the urethra the canal becomes correspondingly less irregular and approximates closer and closer to a uniform canal, and, as the least pressure exerted by the instrument was certainly greater than that exerted by the passage of a stream of urine, it is but fair to infer that during the act of urination the urethral canal becomes still more uniform in calibre; indeed, my observations have led me to the conclusion that during urination the normal urethra assumes the form of a canal of almost uniform calibre.

“Recognizing the fact that the dilatability of the urethra is greater at some places than in others, that in the healthy urethra there is normally a loss of dilatability at certain places, we may modify Sir Charles Bell’s definition of stricture by defining it as any *abnormal* loss of dilatability of the urethra.

“The relationship which stricture bears to the diseases of the urethra, especially to the condition called gleet, has been a much-disputed subject. The pathology of gleet has been so imperfectly understood, and its treatment so uncertain and so multitudinous, that the practitioner who attempts to cure this malady often becomes bewildered, and in the uncertainty born of ignorance tries everything—bougies, copaiba, cubebs, sandal-wood, nostrums, and injections innumerable—until the patient despairs of a cure, and of two evils, a gleet untreated and a gleet overtreated, takes the lesser, and resignedly

submits to his fate, with the not infrequent result that the gleet untreated becomes gradually less and ultimately disappears. . . .

“Shortly after devising the urethrograph I began examining as many urethræ as my somewhat limited opportunities permitted, with the view of ascertaining the shape of the urethral canal. One day, while pursuing my investigations in the dead-room, I stumbled across a well-marked stricture in a urethra whose calibre was thirty millimetres, while at the strictured portion it was contracted to twenty millimetres. I then opened the urethra to make an ocular examination, when, to my amazement no stricture was to be seen. I ran my finger along the glistening mucous membrane; still no stricture could be detected. I then examined closely the spot where the urethrograph indicated the stricture to be, and discovered that the mucous membrane at this part was paler than the adjacent mucous membrane, and, on stretching the urethra by drawing on either side of the incision, it was noticed that at the point indicated as being strictured the urethra was less elastic, stretching less readily than the adjacent mucous membrane—and this was all there was to be seen. Yet here was a stricture which narrowed the calibre of the dilated urethra ten millimetres, which did not narrow the undilated urethra; in fact, it was only a stricture when the urethra was artificially dilated beyond its normal requirements, and practically, so far as obstructing the flow of urine was concerned, was no stricture at all. . . .

“In considering the alleged dependence of gleet upon stricture, it may be well to remember the incontestable facts that many a gleet persists without the presence of strictures, or even after their removal; that many a gleet

is perpetuated by the over-anxious attempts of the surgeon to cure it, and will often subside with the subsidence of treatment. If, as has been asserted, 'the slightest encroachment upon the calibre of the urethral canal is sufficient to perpetuate a urethral discharge, or even, under favoring conditions, to establish it *de novo*, without venereal contact,' then would the male portion of society be in a sorry plight, and a urethra without a chronic discharge would be one of the curiosities of medicine."

CHAPTER IX.

TRUE ORGANIC STRICTURE.

IN the preceding chapter we have set forth our idea of *true* stricture, eliminating conditions heretofore included in the definitions of stricture of the urethra. We wish to change the nomenclature of the old-time description of "inflammatory," "spasmodic," and "large calibre" strictures—to be hereafter described as,

First: Acute catarrhal inflammation involving temporary swelling of the mucous membrane.

Second: Reflex irritability or nervous muscular spasm.

Third: Chronic anterior urethritis.

Thus leaving only one variety of stricture to be described, namely,

True organic stricture of the urethra, whether caused by precedent inflammation (ulceration), or traumatism.

If such changes in nomenclature were made, I think we might define true organic stricture of the urethra as *a pathological condition of connective-tissue growth sufficient to interfere with the normal functions of the genito-urinary tract*. Let us measure our description of stricture by this definition as we proceed.

Causes. Experience with the endoscope, and at the post-mortem table and laboratory, has convinced me that all true strictures, except those caused by traumatism and the *pressure* effects of new growths, are undoubtedly

due to ulceration of the mucous membrane at some time during the process of disease. In support of this theory, in addition to my own by no means small experience, I may also quote from the work of our representative American pathologists, Professors Delafield and Prudden,¹ under the heading of "urethra :"

"Strictures of the urethra are usually produced by inflammation of its walls." (Page 427.)

The stricture may be *temporary*, produced by a diffuse inflammatory swelling of the mucous membrane, or by the raising of the relaxed membrane into a fold or pocket.

Permanent strictures are produced by structural changes in the walls of the urethra :

1. The mucous membrane and submucous tissue are left hard and unyielding by the preceding inflammation. Subsequently the new fibrous tissue contracts and narrows the canal.

2. Ulceration of the mucous membrane leaves cicatricial tissue, which contracts, and also produces adhesions and bands of fibrous tissue.

3. There is fibrous induration of the corpus spongiosum and consequent constrictions of the urethra.

Dittel of Vienna,² who has written one of the most comprehensive descriptions of the pathology of stricture of the urethra, under the heading of "organic stricture," says : "If I review before my mind all the strictures of the urethra that I have seen both upon the living and the dead, in general they are composed . . .

¹ Hand-book of Pathological Anatomy and Histology. Wm. Wood & Co., 1889.

² Pitha-Billroth : Deutsche Chirurgie.

—the first form, of new connective-tissue changes; a second form, of new hetero-plastic growths.”

And further in the description of the anatomy of “callous strictures,” he particularly calls attention to granulations of the urethra which were discovered by Desormeaux and described in his work on the Endoscope.

If undue space has been devoted to determining to what cause true organic stricture really is due, it is because the author remembers his own student days, and the endless wrangles and debates that filled students’ brains with visions of stricture in all grades and descriptions, and to call attention to the *only two* conditions of causation. The first is *traumatism*—as, falls upon the perineum, local wounds whether by force from without or rough instrumentation from within, connective-tissue contraction (scar tissue) from chancroid—non-infecting ulceration—within the urethra, or from so-called “breaking of a chordee,” and other injuries of a like nature. The only other causes of organic stricture, and the most frequent, are—the after-effects of *inflammation*, from gonorrhœa or chemical irritation causing ulceration and the formation of new connective tissue which subsequently contracts, causing diminution of the calibre of the urethral canal. Thus traumatism and the results from inflammation are identical. This fulfils the first portion of our definition as to new connective tissue being the cause.

Symptoms. What are the symptoms of organic stricture? As a rule, discharge from the urethra is the most constant, already described as occurring in anterior or posterior chronic urethritis. The character of this discharge needs to be examined in relation to its quantity, its duration, and its precedent history. That

this pathological fluid is usually more or less mucopurulent, becoming decidedly more purulent after a night of venery or a bout of drinking, is also true in cases of stricture as well as in chronic urethritis. The urine shows flecks of dead tissue, long and short flocculi. Albumin will usually be present, and there will be a decidedly cloudy sediment. The microscope will discover that the presence of pus or blood, or both, may have caused response to the test for albumin, or else upon filtering these products from the urine there may be found a condition of true albuminuria. Epithelium and perhaps casts, as before described, are present.

The time during which the discharge may have continued may be an element of value in the diagnosis of stricture. In a later paragraph we shall see that it is possible for discharge to appear in the urethra from other causes than those purely venereal. One very celebrated professor of genito-urinary surgery in New York suspects stricture of the urethra if the chronic discharge following a case of urethritis persists over eight months, but he recognizes the fact that abnormal discharge may be actuated by a gouty diathesis or acid urine, and the sediment in the urine of pus, blood, and epithelium may be caused by pyelitis or other disease of the kidney or bladder. I am prepared to say positively that there are cases of granular or chronically inflamed urethral canals where the discharge has continued for years (five or six) where there is neither evidence of stricture or kidney lesion.

The next most constant symptom of stricture is increased frequency of micturition. In speaking, under the subject of gonorrhœa, of contracted meatus as retaining urethral discharge, we incidentally mentioned the

effect of such a constriction upon the bladder as causing in adult life symptoms of increased frequency of urination. The same, of course, is true of growing strictures. A patient has had, perhaps for years, a chronic discharge, sometimes apparently cured, but which again appears as mucus only. This, he thinks, is simply gleet, and pays no further attention to it. In all likelihood many physicians have vainly endeavored to cure it, and since they have been unsuccessful in their attempts, he thinks further medication useless and so neglects it altogether. Presently he notices, upon drinking a bottle of beer or other beverage before going to bed, that some time during the night he is awakened by cramps in his abdomen over the lower part, or by an urgent desire to pass water to which he must attend; from an occasional occurrence this becomes constant, and the daytime calls for urination are more frequent than formerly.

A man may have a stricture for years, and still never know it until these slight warnings give notice of a narrowing of the canal. Among the first symptoms is an irregularity or narrowing of the stream, but this is not true of all cases. Much depends upon the situation of the stricture, its area, and its character.

Often one of the earliest manifestations of stricture may be noticed in the outflow of semen. The patient will notice, at the time of ejaculation in coitus, that instead of the quick vigorous ejection of the seminal fluid as before, there is rather a dribbling or simple running out of the fluid from the meatus. Also he will assent when questioned about seminal pollutions, that after one of these occurrences there are sharp shooting pains in the perineum, and a feeling of fulness as if the

whole perineum had been violently distended, enough to cause a bruised feeling of the muscles. False impotence, either partial or complete, may be a well-marked symptom of forming stricture, the patient being unable to have a complete erection—which symptom disappears as soon as the strictured portion is relieved. These symptoms of stricture may be all or singly present in more or less intensity in each individual case.

The second portion, then, of our definition, as regarding *function*, is true. The *effects* of stricture will be much better described by themselves.

The whole genito-urinary system, as we know, may be traced as a continuous mucous membrane through the urethra, bladder, and ureters to the pelvis of the kidney. Unlike any simile in inanimate nature, a mucous covering invests a muscular and fibrous structure, so that when fluid passes out through these tubes, the circular muscular fibres contract to expel the last portion of fluid which, if there were no extra pressure to remove it, would remain in the tube. As can be readily seen, with a normal and patent canal there is no extra work for the muscles either of the bladder or of the urethra to perform; quite the contrary occurs, however, when narrowing of the tube forms a bar to the ready outflow of urine. Let us see what happens.

Results. The results of stricture in the first place are mainly mechanical; the strictured portion refuses to dilate as much as the other portions of the canal, and acts somewhat like a dam. The urine strikes forcibly against this narrowed portion, and tends to dilate the urethra behind it, and, if stricture occurs in several places, perhaps to form these pouches behind each one. This damming back of the urine also pushes the fluid

into the mouths or openings of each of the lacunæ and ducts which open into the urethra behind the stricture, forcing them open into widened pouches, capable of catching the points of instruments, and beginning those diverticuli or false passages which may so easily be made complete with unskilful instrumentation. In this way the prostate may become pouched, and its substance much atrophied, the fibrous partitions alone remaining.

The many sets of muscles with which the bladder is encircled exert an immense amount of pressure upon the non-compressible fluid contents of that organ, and the projected stream, striking with force the already stretched and diluted mucous membrane behind the stricture, weakens that membrane, and leads to an abnormal secretion from its surface. The thinned membrane is constantly irritated by acid urine, and pouching takes place, holding a certain quantity of stale residual urine, from which the tube is unable to free itself, and which ferments by the action of the mucous deposit liberating carbonate of ammonia. This mild inflammation furnishes the gleet discharge in stricture.

It would be no task to enumerate the multiple subsequent processes which may follow in the train of this condition, but space does not permit. It will only be necessary to further point out that as the stricture increases in tightness, the ulcerated points from which it started increase in size, and the area of inflammation, constantly approaching the bladder by extension of the process, finally sets up inflammation of the neck of the bladder, and slight symptoms of *cystitis* appear. As the inflammation of the mucous membrane of the urethral canal behind a stricture is always becoming greater, retention may follow.

Should the patient become chilled from any cause, especially after a debauch, what happens? As a rule, retention; and surgeons who do not thoroughly understand that it is not the tightness of the stricture at this time that causes retention, but the swelling of the mucous membrane about it, are surprised to find how easily one may enter the bladder with a soft instrument, or relieve the patient with a warm bath and a little opium. Several attacks of retention may occur at long intervals, the patient never applying for relief, as these spasms may be of only a few hours' duration.

In case cystitis is set up, there is a constant desire to pass water, at first only once or twice at night, and a little oftener than usual during the day, until, when he seeks relief, the poor patient may be utterly worn out from attending to the constant calls to urinate by day and by night.

From constant straining, and from the degree of inflammation within the bladder, *hypertrophy* takes place, by enlargement of the muscles which empty that viscus, and probably from an amount of parenchymatous thickening set up by the cystitis.

Further, the bladder may become sacculated; and deposit of phosphatic material in a pocket may combine with the mucus to form stone.

We should not lose sight of the fact that the bladder may sometimes become thinned instead of thickened, in which case there is *dilatation*. It must be remembered that an already filled bladder, whose contents are minute by minute being added to by the pressure of the blood through the kidneys, must be relieved, or rupture may occur, although, as a rule, overflow takes place before

such a catastrophe happens, and the bladder is relieved by a drop at a time being forced through the stricture. This dribbling must not be taken for incontinence of urine.

The ureters may enlarge enormously, and inflammation extend to the pelvis of the kidney, causing pyelitis or nephritis (surgical kidney).

CHAPTER X.

INSTRUMENTS USED IN EXAMINING FOR STRICTURE.

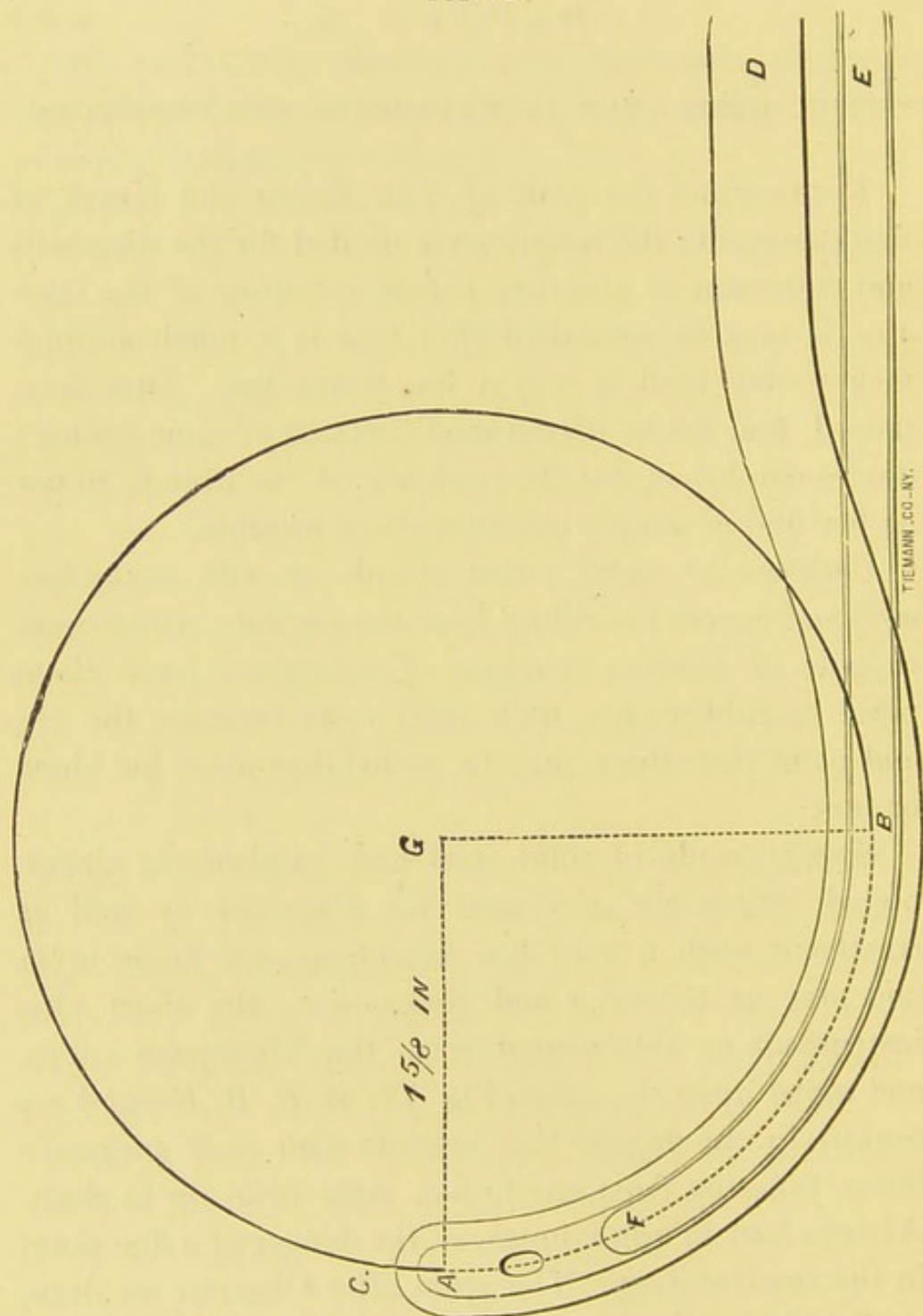
FOLLOWING the plan of Van Buren and Keyes, of first describing the instruments needed for the diagnosis and treatment of stricture before speaking of the therapy, it may be remarked that this is a much simpler task to-day than it was a few years ago. One may, indeed, find ten or fifteen modifications of some genius's device employed, but the tendency of the time is to use as few and as simple instruments as possible.

Catheters of metal, either simple or with snake-like sectional curves for riding over the prostate, which were capable of holding drachms of contagion, have given place to rubber ones, with solid ends between the eye and point that there may be no lodging-place for blood or pus.

Sounds, made of solid steel and handsomely nickel-plated, which are now used for diagnosis as well as treatment, with a very few exceptions, are made upon one plan as to curve and shape—*i. e.*, the short Otis instrument as abbreviated from the Thompson curve, and noted upon the scale (Fig. 12) as *F*, *B*, *E*—and are conical in the degree that accords with each surgeon's fancy, tapering from one to five sizes from tip to shaft. Always bear in mind, however, the danger of a fine point in the smaller sizes. The scale after Charrier we deem preferable to all others, since it is in more general use, being almost universally so on the Continent. We shall

always be understood to mean the French scale when speaking of sizes. A *scale-plate* is quite necessary for

FIG. 12.



every outfit, since numbers rub out on soft bougies, and the scale numbers placed upon them by manufacturers

are too numerous to mention. Artisans, also, are sometimes very careless in numbering sounds. These plates are preferably made of metal, nickel-plated, and having a scale of linear measurement upon the edge, either in inches or centimetres, whichever is most convenient or best known.

The steel sound is used, as above said, for purposes of diagnosis and of treatment. For *diagnosis*, the solid sound has but small range—since we believe that in America there are few occurrences of stricture back of the triangular ligament, and, as a consequence, there is but little use for what seldom occurs. However, when the bulbous instrument next to be described has failed to discover an appreciable stricture in front of the triangular ligament, a steel sound as large as will be comfortably admitted by the meatus, when the latter is normal in size, should be passed into the bladder, to ascertain whether the posterior urethra is of normal or of *sufficient* calibre.

Many students buy instruments, and particularly cases of sounds, before they graduate. They have no fixed idea as to what is desirable to purchase, except the magic “steel sound” which they have heard so often lectured upon; and as instrument-makers seem to know still less of what are the essential requirements of the present day, the chances are that a man will be sold an old model with the longest sort of a curve and the flattest of points, and an assortment from the size of a knitting-needle up to No. 40 French. It is better, therefore, for the student to ask the advice of his professor of the genito-urinary department before purchasing a set of instruments that is to be used so often in his professional career. The set need not include more numbers than from No. 18

French to No. 35 French, since a sound smaller than the conical tip of No. 18 is a dangerous instrument in any hand except that of an expert, and strictures of smaller size should be treated by the soft instruments hereafter to be spoken of.

A sound once used should be immediately placed in hot water, washed with soap, dried with a soft towel, polished with a rouge chamois-skin and put into a velvet- or flannel-lined drawer or case. There should never be a suspicion of rust, nicks, scratches, dirt, or oil upon an instrument that is to perform such delicate work. It will not do to wipe them hurriedly and then toss them into a drawer where they will be jostled together to be dented and scratched, and, being dirty, perhaps infect the next patient who comes along. Let your patients see the care you bestow upon your instruments, and be assured the moral effect will be good. Antisepsis of the most rigorous order is necessary when dealing with all urethral instruments, and what is said of sounds applies to all the other devices constructed of metal for this department of surgical work. A well-known surgeon in this city advises keeping sounds in boro-glycerite when not in use. This advice may do for him, since his antiseptic creed is always well kept, but it will not do for most of us to get into the habit of depending upon a little carbolic acid in water for asepsis. Such practices make us careless; we must, on the contrary, be accustomed to deal in the most radical way with dirt, pus, urine, and blood. There is no better precaution for cleanliness and asepsis than boiling-hot water; no germ can stand that temperature and maintain his cheerfulness. The day of sweet oil as a lubricant has passed. Vaseline, albolene, or cosmoline, liquid or

solid, have taken its place; these hydrocarbons are of themselves germ-proof and never grow rancid.

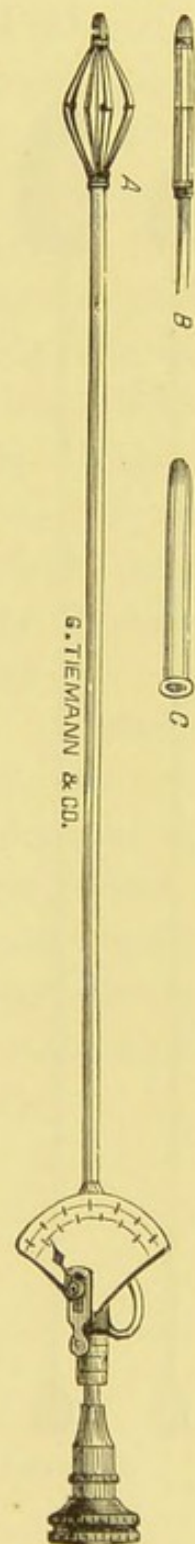
The urethrometer. In examining a patient for stricture no instrument equals Prof. Otis's urethrometer. As the urethrometer is clearly shown in the accompanying figure (Fig. 13) no detailed description will be necessary. *A* shows the instrument opened by turning the milled screw at the handle, which in turn moves the indicator on the dial-plate until the opening blades of the bulbous end correspond in size to the scale marked upon the plate. *B* is the bulbous extremity closed. *C* is a rubber "stall" to be drawn over the end of the instrument to prevent injury to the expanding blades and to protect them from the urethral secretions.

This instrument is introduced closed, passed *down to the bulb*, but not further; the blades are then expanded until the patient declares that they fill the urethra completely. The instrument is then slowly withdrawn; as the blades approach any strictured portion of the canal the resistance notifies the operator, who decreases the calibre of the expanding end until the bulb will pass the obstruction; the depth at which passage has been hindered is noted from the scale on the shaft, while the canal's narrowed diameter is indicated by the index.

The advantages claimed for this most excellent instrument are:

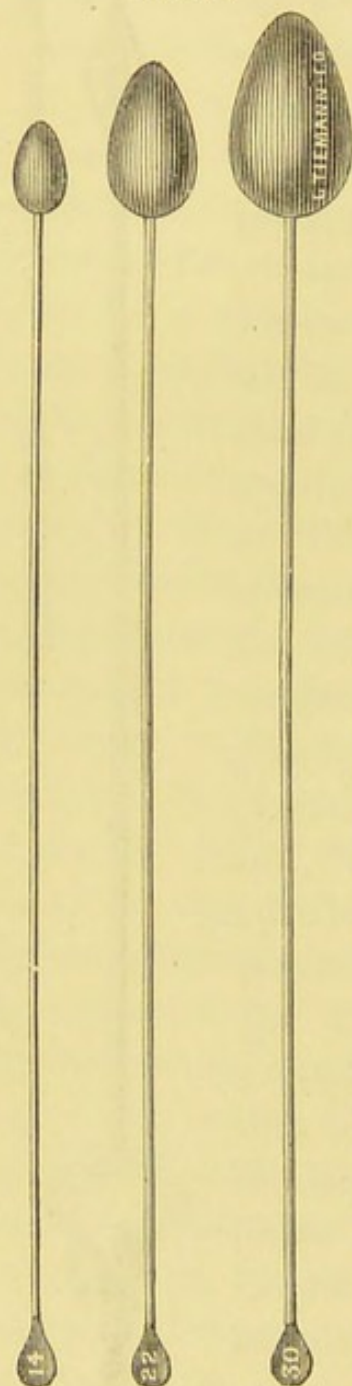
1. Its capacity to measure the size of the

FIG. 13.

Prof. Otis's
urethrometer.

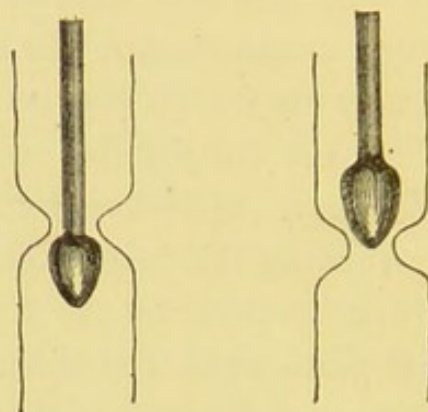
urethra and to ascertain the locality and size of any stricture present, *without reference to the size of the meatus.*

FIG. 14.



Bougies-à-boule.

FIG. 15.



At a stricture.

2. It enables the surgeon to complete the examination of several strictures by a single introduction of the instrument, and by reduction of its size to avoid irritation, which usually attends the withdrawal of the ordinary bougie-à-boule or bulbous sound.

One should, however, take the following precautions to test this instrument before purchasing it: See that with the rubber "stall" on the end of the bulb the index corresponds with the number of the opening through which instrument passes in the scale-plate. Get a guarantee that the delicate screw movement in the end will be kept in order by the manufacturer for at least a year; otherwise use bulbous sounds.

Bougies-à-boule, or *bulbous sounds*, are made of steel or rubber. There is no advantage in using the latter variety, as was formerly thought, on account of their softness in giving the patient less pain and the possibility of pushing them on to the bladder. The steel instruments, with a solid head safely *soldered*, not screwed on to the delicate wire, made single, with the No. on the handle of each, and a well-accentuated shoulder which will strike squarely against any projection in the canal, are superior to all soft instruments. *They can be boiled.* They may be bent to search the posterior urethra. Also, they do not spoil in hot weather. Fig. 14 shows a correct form of bougie-à-boule, and Fig. 15 the manner in which it detects a stricture, its depth being measured by holding the thumb-nail on the shank of the instrument, withdrawing it and applying it to the side of the scale-plate or to a pocket rule. A smaller bulb must then be introduced, passed below the narrowed portion and then withdrawn until the shoulder comes in contact with the lower edge of the stricture, which is known by the little "click" or shock felt upon the steel when moved back and forth, the length between the two measurements showing the extent of the encroachment upon the canal.

CHAPTER XI.

INSTRUMENTS USED IN TREATMENT OF STRICTURE.

HAVING described the instruments to be used for the *diagnosis* of stricture, there yet remains those used for its *treatment*.

Foremost among these is the *steel sound*. The therapeutic use of this sound will be described hereafter.

The *soft* or flexible instruments will first engage our attention.

Should any surgeon be curious enough to visit hospitals, dispensaries, or clinics, with a view to making a collection of old and discarded instruments, there would hardly be a field of greater interest than that of the genito-urinary department of surgery. Bougies, catheters, sounds, divulsers, etc., *ad nauseam*, fill our shelves and drawers. Having determined to depart from the usual course in books which describe everything invented since the civilized age of man down to the present moment, we will consider only the instruments absolutely necessary for the practitioner to have on hand. Therefore, skipping descriptions of round this, and triangular that, we plunge *in medias res* into the subject of soft instruments.

Elastic catheters. In all the older works one finds the catheter spoken of as the exploring instrument. It was generally of metal. It might or might not be hollow, although considered of more value if capable both of entering the bladder and drawing off the water, at the same time being of diagnostic use. At the present

day the word catheter is understood to imply a hollow instrument. Of this, as a mere tube to empty the bladder, we shall merely mention the present high state of perfection in their manufacture reached by Messrs. Tiemann & Co., in their "velvet eye" soft-rubber catheters, with solid points between the conical end and the eye to prevent lodgment of contagion. These instruments should be purchased as wanted, or kept in a solution of carbolic acid and water, otherwise they become brittle and are liable to break off in the bladder. In order to prevent this accident, always remember to twine one around the finger before using, and then examine it for cracks or breaks.

The Mercier "catheter-coudé," or elbowed catheter, is without doubt the best soft instrument we possess (Fig. 16). The French variety, made of a linen framework covered with gum, are softer and more elastic, but are more easily damaged, and like other soft, gummy instruments do not stand American summer weather; they should be dusted with talc powder when not in use. The English manufacture a variety of flexible goods for catheters, bougies, etc., that are much superior to any other make, since they are stiffer and more durable, being of linen framework covered with wax and some gummy substance in varnish form, so that by simply dipping them in warm water they become as soft and elastic as the French make. Both varieties of this "elbowed" catheter for difficult cases are invaluable.

All these instruments should be washed in running water immediately after using, and afterward disinfected by means of a bichloride of mercury solution being syringed through them.

FIG. 16.



Mercier
"catheter-
coudé."

FIG. 17.



FIG. 18.

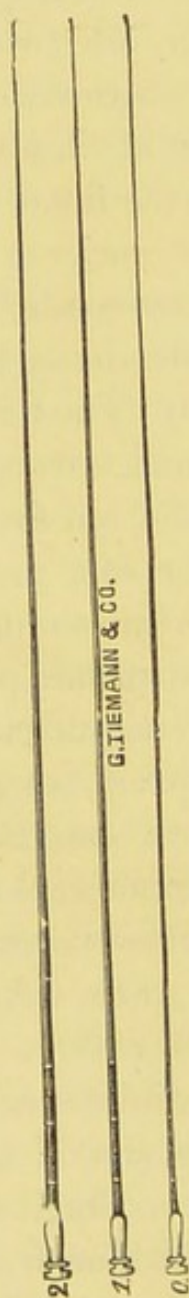


FIG. 19.



Bougies, or solid instruments of a flexible nature, are of both the black (French) and yellow (English) makes, ranging from *filiform* to bougies of all sizes up to No. 30 French. Some are made with metal or whalebone cores; others, composed entirely of the gummy substance, are to be preferred, the stiffest of them being chosen.¹ (Figs. 17, 18, 19, 20, 21, 22.)

FIG. 20.



FIG. 21.



FIG. 22.



When describing steel sounds we gave it as our opinion that no solid instrument of smaller size than No. 18

¹ It does not seem to be well known by the profession that gum or rubber instruments should never be oiled; greasy substances spoil the rubber. Glycerin or albumin is always to be used in order to have them in good condition.

French should be used, except in most expert hands; in this only reiterating the expressed conviction of all authors on genito-urinary disease. Strictures that refuse passage to the point of a conical No. 18 French steel sound are dangerous situations for even the most skilful to face; the immense amount of leverage capable of being exercised by a sound, in connection with the softened and thinned condition behind the stricture, make the use of gum bougies almost imperative.

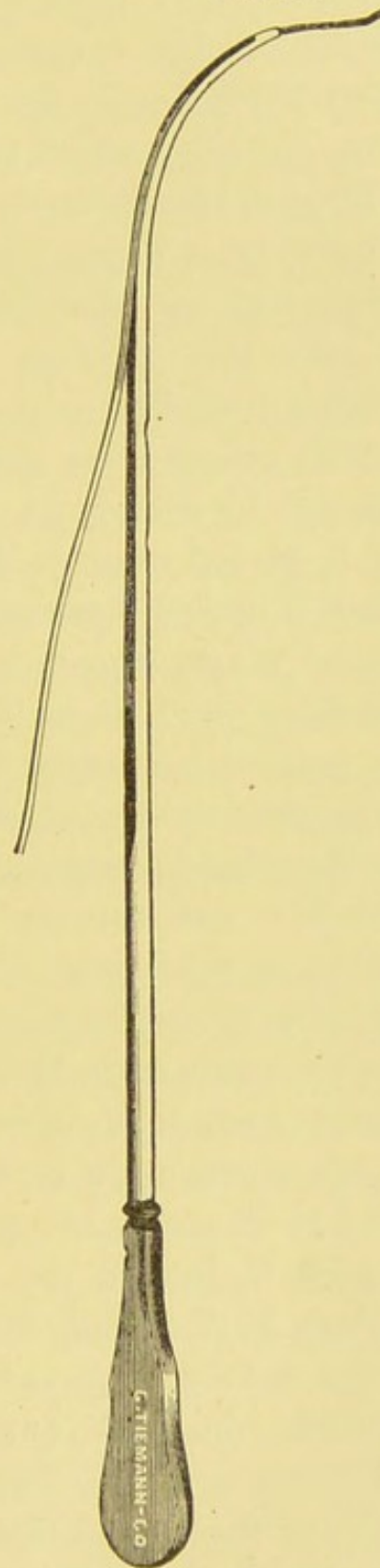
Gouley says upon this subject: "Their great advantage is, that anybody can introduce them, . . . and no danger is to be apprehended of lacerating the mucous membrane. They are the safest instruments in the hands of a beginner. . . . I have no ordinary steel sounds smaller than No. 7 English (No. 13 French)—but having reached that number, I usually set aside the elastic instruments to use the smoothly polished conical sounds."

Filiform whalebone bougies play a decidedly important part in the treatment of retention. These small instruments are of immense advantage in treating strictures of small calibre, either singly or after the manner of Dumreicher, who filled the whole of the urethra with filiform bougies, trying one after the other, until one of the number found the entrance to the stricture and could then be forced into it. These filiform instruments are either straight with a slightly olive point, or are bent into elbows, shoulders, or other bends and twists. The advantage of these instruments is the stiffness and convenient curve given to their points, which may be turned in all directions within the urethra in order to engage the end of the bougie in the real opening of the stricture. One may see at a glance, as they are pictured in

FIG. 23.



FIG. 24.



The Gouley tunnelled sound with conducting
filiform bougie.

Fig. 23, how useful they are for the purpose of entering all varieties of close contractions. They have also another use: Prof. Gouley has devised a tunnelled sound or catheter, in using which the surgeon first passes the bougie through the stricture, ascertaining the place by lightly drawing it gently back and forth, when finally the stricture grasps or "bites" the instrument — one is then sure that no false passage has been made; the "Gouley tunnelled sound" or catheter (Fig. 24) is slipped over one of these guides, which should be two feet long, and by sliding the sound downward upon it entrance is gained through the constriction to the bladder. Care is needed, however, to see that the ring end of the sound is very smooth. Instead of the instrument being made of steel, it is better made of silver, with the ring portion hammered in a little to give it a very blunt edge, otherwise it is liable to wound the urethra, or to cut the whalebone guide in two, leaving one part in the bladder and urethra. This device is superior to all others in attempting the passage to the bladder, since the softer filiform bougies when screwed to small sounds or the guide of a Maisonneuve are likely to be loose in the screw-joint, or to curl up in front of the stricture, appearing again at the meatus.

The day of *divulsion* has passed, and there is therefore no need to burden our pages with the curiosities of other days by describing divulsers. We believe that there is not a surgeon of any prominence in genito-urinary work who still continues the barbarous and unskilful practice of divulsing—at least, not in the larger cities of the United States.

National pride ought to swell every American surgeon's breast when he looks over the literature pre-

sented to the profession by reputable and progressive journals upon the subject of treatment of stricture. In this direction, doubtless, we lead the world. Prof. Otis, of New York, one of the cleverest and most scientific men who ever wrote upon the subject of stricture, has made us indebted to his genius, not only for our best instruments of precision, but for the thoroughness of his teachings. Yet it is probable that many of the younger generation of genito-urinary surgeons will agree that what he so earnestly taught us a few years ago may be somewhat modified without dimming his reputation. If in the ensuing remarks upon the treatment of *true stricture*, the treatment recommended is not so vigorous or so radical as his own, we give him the credit of leading us as surgeons to a more thorough understanding of what stricture really means, and of teaching us the use of instruments of precision and the need of more radical treatment than prevailed before his time.

Urethrotomy. As we shall hereafter see, there are varieties of true stricture that are only temporarily relieved by dilatation; as quickly as we enlarge them they re-contract as badly as if no treatment had been attempted. These are the *resilient strictures*, usually of traumatic origin; they may, however, be from virulent catarrhal causes. They require cutting wherever situated—either in front of or behind the triangular ligament. If in the former situation we should perform *internal urethrotomy*, seldom cutting beyond four and a half inches from the meatus, and never over five inches. This applies to all those cases anterior to the triangular ligament. In the deeper position we should always do an *external urethrotomy*.

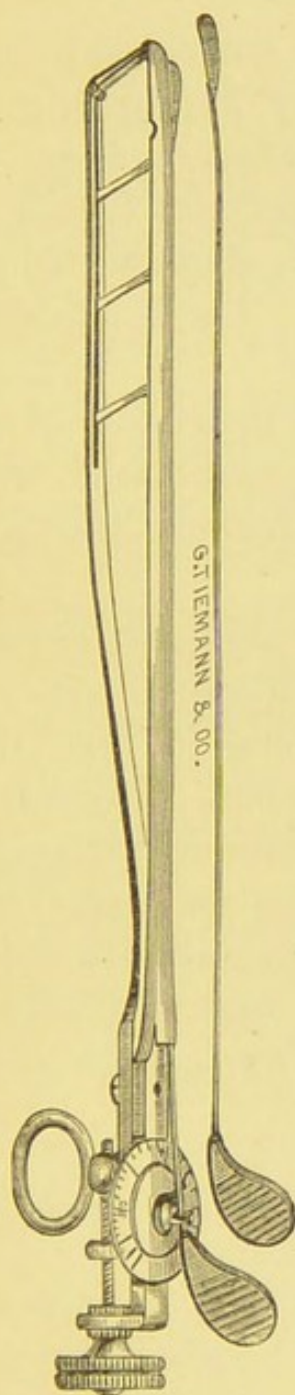
Internal urethrotomy is an operation made with cutting instruments *inside* the urethra, anywhere in the canal from just below the meatus (the enlarging of which is called meatotomy) to the bulb of the spongy portion. It was customary only a few years ago to cut under the triangular ligament and into the membranous portion, and instruments for that purpose are still seen, with a curve like a sound and knives that cut to the end. The operation, however, in this portion is now justly considered too dangerous, and, moreover, to cut internally is giving no escape to possible suppuration; therefore—

External urethrotomy, or the opening of the membranous and prostatic urethra through the perineum, is employed, in order to drain the bladder and cut a stricture through the external wound. The portion of the canal operated on has thus a chance to heal without the urine passing over it, and the overworked bladder is enabled to recover its tone before the external cut is entirely healed.

For these anterior cases there is at present no instrument that equals the “Otis urethrotome” (Fig. 25), which is made, according to his latest directions, without the curve. Doubtless, no surgeons at the present day perform internal operations *behind* the triangular ligament.

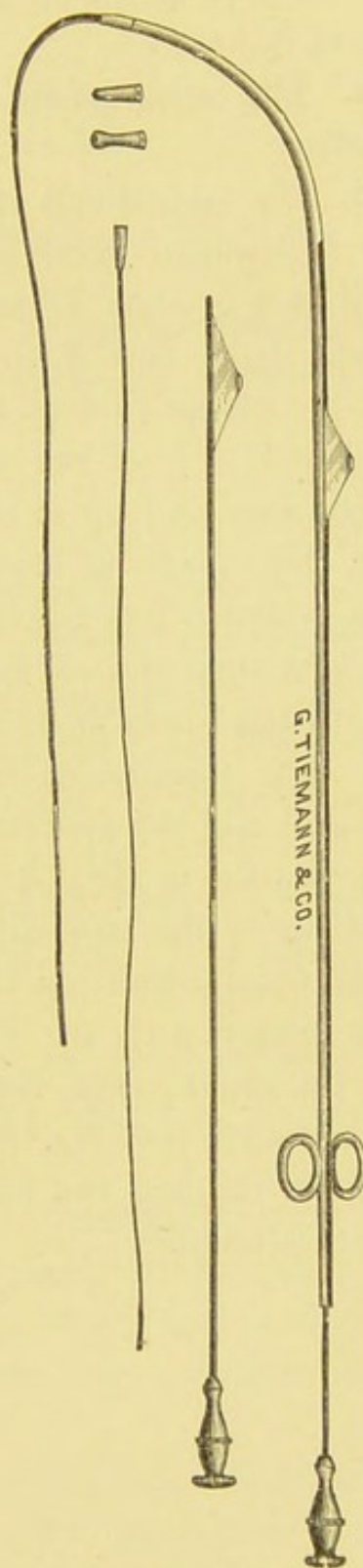
As a cheaper and simpler instrument, but inferior in many ways to the above, is the “Maisonneuve urethrotome.” (Fig. 26.) It consists of a deeply grooved sound, with a small ring near its distal extremity as a handle, a long stem with a triangular knife attached, and a gum-elastic filiform conducting bougie.

FIG. 25.



Otis urethrotome.

FIG. 26.



Maisonneuve uréthrotome.

The steps of the operation, according to Maisonneuve, are as follows :

1. The gum-elastic bougie is introduced past the stricture.

2. The vesical end of the *sound* is screwed to it, and the instrument is slowly and gently pushed onward until it has gone beyond the obstruction, and can be moved back and forth without impediment (which it can do, except in very tight strictures, since the sound is only No. 7 of the French scale). The conducting bougie may coil up in the bladder.

3. The blade is made to glide in the groove of the sound until it has reached the part to be divided. The penis is then drawn forward, the sound steadied, and the cutting blade pushed forward.

4. The instrument is slowly and cautiously drawn forward, and the operation is thus terminated.

A glance at Fig. 25 almost explains in itself the working of the Otis dilating urethrotome. The screw at the handle controls the required width of dilatation. The blades with the knife in position are introduced into the canal ; then turning the screw until the indicator shows the No. to which you have determined to cut is reached, the knife is withdrawn, and the stricture is sundered.

CHAPTER XII.

VARIETIES AND USUAL SITES OF STRICTURE.

THE varieties of stricture that engage our attention as surgeons consist of (*a*) annular; (*b*) linear; (*c*) tortuous; (*d*) eccentric. (Boeckel.)

(*a*) Is as if a thread was drawn around the tube; is short in extent; may be a hard, crescentic fold, involving only a portion of the circumference of the tube, or a membranous diaphragm with its orifice at any site, either at the centre or to one side, or, as suggested by Thompson, can be two strips of mucous membrane, which have grown together from some precedent rough instrumentation within the urethral canal.

(*b*) Is annular, but larger in extent than the former; may involve portions only of the tube or its whole circumference.

(*c*) Are varieties of former two; are tortuous, irregular, longer than others; may involve nearly all of pendulous tube.

(*d*) Is also tortuous. Faulty instrumentation may "pocket" a stricture with the opening to one side of the tube, and one might easily push a sharp and moderately stiff bougie or sound into the canal further down, making a "false passage."

It is needless to say that all grades of contraction can occur in the urethra, varying from an almost imperceptible narrowing to nearly total occlusion. Total occlusion probably never occurs except after the canal has been severed by traumatism.

Well-kept notes of over three hundred cases, where actual examination of the anterior urethra was always practised, show stricture to be usually single, although sometimes two and even three were found. Authorities of the highest standing have, however, found from six to eleven in one living urethra. The statistics from museum preparations and dead bodies are probably worthless. I have many times found well-marked double stricture—one at the fossa navicularis and the other in the region of the bulb.

Sites. The seat of stricture does not cause painful discussion in the professional world as it did a few years ago. Otis and a few other conscientious workers have settled for good that wherever may be the seat of stricture in the English and Continental urethra, it certainly is most frequent with Americans in that portion anterior to the triangular ligament, excepting always traumatic strictures, which may occur anywhere except in the prostatic portion. And, as conditions of medicine and hygiene change through every decade, books printed years ago, and statistics gathered in other lands and under other conditions of instruments and remedies, are no longer reliable. The older practitioners of to-day are even yet thinking learnedly of the prostatic strictures which they were taught to believe were the commonest variety, but which we now know *never* occur. Operations of divulsion are no longer practised, unless by provincial surgeons, but our predecessors may have encountered the after-results of barbarous methods—as divulsion, abortive injections of chemicals, instruments which cut and bruised both roof and floor; these legacies supplying the material for their tables of statistics. One's earliest professional days having been passed under

the instruction of the most careful and competent teachers is a guarantee of a chance to observe better methods and to collect more reliable statistics than other far more able and more brilliant writers of a former day. And what has been my own experience during the past ten years will, without doubt, nearly correspond with that observed by other surgeons, namely, that the commonest seat of stricture is pretty evenly distributed over the inch of tissue starting from a point one-half inch back from the meatus and running from that situation an inch deeper; that the second most frequent situation is at the region just a trifle anterior to the bulb; while the third variety in point of frequency occupies any portion between these two points in the pendulous portion of the urethra. The writer has no pet theory or particular hobby to sustain; what is here written has been prompted by the remembrance of actual work, and the spirit that has actuated these statements is the desire to present the exact truth. And, knowing as we do that gonorrhœa, starting from the meatus and travelling backward, has situations of predilection for the fossa navicularis and the bulb, and as nearly all of our anterior strictures are caused by this disease, it is but reasonable to suppose that these should be the sites of preference for stricture.

How long after disease or injury may we look for stricture of the canal of the male urethra?

First, following gonorrhœal urethritis:

We have been careful to warn our readers to inform their patients that an *acute* attack of gonorrhœa is not to be cured in ten days, but rather ten weeks, or *longer*; that the history of a continuance of a gleety discharge lasting ten or twelve months does not prejudice our diagnosis, or prepare our tactile senses to find stricture

under *any circumstances*, but rather that we are more likely to find a granular and hardened urethra to deal with. Taking into consideration other circumstances, J. D. Hill's analysis, as quoted by Keyes, seems pretty fairly to represent the duration of time for both varieties of stricture—*i. e.*, stricture following gonorrhœa and that of a traumatic origin :

“One hundred and forty cases of stricture from all causes make the length of the period between the cause and the first symptom of stricture noticed, to be : After gonorrhœa, shortest period two years, longest thirteen years ; after urethral chancre (chancreoid), shortest period ten months, longest three years ; after injury, shortest period four months, longest eighteen months.”

In regard to the first variety I think the figures quite right, with only one or two exceptions that occur in my notes or to my mind. In one case, if the patient did not lie in his history, he surely had a stricture following an acute attack of gonorrhœa in ten months ; in two others stricture followed inside of sixteen months. While thirteen years may seem to the inexperienced a very long time for a urethral discharge to continue, the following case confirms the statement above written. The authority is so good and the case so instructive, as showing how long a gleety discharge may be uncomplicated by stricture, that it is suitable to introduce the history into our text :

At Professor Ultzmann's office in Vienna I saw a patient (an army officer) who had had a chronic discharge from his urethra for thirteen years. This patient, Professor Ultzmann assured me, “had no stricture, since a No. 26 French sound passed to his bladder.” I afterward made this gentleman's acquaintance ; he assured

me that after the treatment he had received by the daily passage of sounds and the washing out of the bladder and urethra, he was entirely well at the end of six weeks, and had remained so ever since.

Strictures caused by chemical irritants and urethral chancreoid probably occur very rapidly.

The jewel truth is so often hidden under immaterial evidence, or a downright intent on the part of patients to tell an untruth for the purpose of hiding their indiscretions and having us believe that disease was caused by legitimate accidents, that it is necessary to sift every statement judicially as far as possible. Many a doctor who has had much to do with clinical work will call to mind the time when he laughed at a patient who had a stricture and who positively declared he never had the clap. If one stops to analyze the causes of stricture, it will be remembered that many peculiar accidents happen to cause traumatic stricture, and the patient in the case supposed *may* be telling the truth. A great many of our clinical patients, having exchanged confidences with their fellow-sufferers, and while awaiting their turn to the consulting-room, arrange their own cases to suit themselves, and the desire to have their disease appear to have been caused by innocent means prompts them to lie to us.

Statistics concerning these diseases should be gathered with great care as to the clinical history, strengthened as much as possible by actual examination. It must not be overlooked that Sir Henry Thompson found stricture, in the majority of his cases, far posterior to those obtained by Prof. Otis, and in our tables we must always recognize the fact that the deep urethral strictures are sometimes caused by gonorrhœal inflammation

as well as traumatism. In relation to these latter strictures, *i. e.*, traumatic, we must not count the first and immediate symptoms caused by blood œdema and swelling. These are usually incidental to the injury, but when inflammation subsides and repair sets in, contraction is sure to follow. This, then, renders our path to a correct conclusion the more complex. We are bound, however, by the analogy of stricture in other regions where processes of repair can be watched, to believe that stricture may begin as early as four months, but can hardly be delayed as long as eighteen months; probably ten to twelve months will be nearer the true estimate.

Irritable stricture is that condition of the mucous membrane in which it is sensitive, easily excited, causing pain, spasm of the muscles of the spongy urethra, flowing freely with pus whenever *attacked* by instruments. I say "attacked" advisedly. One-half of the so-called irritable strictures are made so by faulty instrumentation. I call to mind one case in particular that was seen by several students and post-graduates, all of whom called it irritable. The case happened in this way: I cut a long, tortuous stricture for a patient who had not the time to embrace the better but longer course of gradual dilatation. The penis was gristly, the discharge profuse and the patient's sleep disturbed twenty times during the night between the chordee and calls to empty the bladder. The urethra was washed with a 1:5000 solution of mercuric bichloride and the stricture freely divided with the Otis urethrotome up to No. 30 French. Being called out of town for a few days I left the patient in the hands of my class. Upon my return I found that the young gentlemen had taken advantage of the opportunity to pass sounds *daily* upon him, and

had begun with No. 30 French. Upon my return and asking about the case, they asked me if I "had cut deeply enough, as it was an irritable stricture and the sounds would not pass at all easily." On trying a No. 30 French, as soon as the sound was in the meatus the poor man strained and grasped the sides of the table as if he were to be murdered. I found upon repeated trials that No. 21 would barely pass the swollen and painful urethra, and it was only by the greatest gentleness in passing sounds, in conjunction with injection of almond oil, into the urethra, and with bland alkalized drinks, a tonic mixture and a suppository of belladonna and opium at bed-time, that I succeeded in keeping his stricture stretched and his symptoms relieved.

Take great care to use the gentlest means of instrumentation, along with good judgment and patience; every case is an individuality, and if you cannot pass a second time the sound you passed a few days before, go back, not one but several Nos., and persevere until you are sure that you have a *resilient stricture*, which is one that will stretch like an elastic band and then contract again, and may at the end of several weeks' treatment be of the same size as when you commenced treatment, or even smaller. Strictures of this sort always need cutting, and are generally of traumatic origin.

CHAPTER XIII.

TREATMENT OF STRICTURES OF LARGE CALIBRE.

IT is customary for writers to divide this subject under many heads, but neither space nor inclination allows me to make this arrangement. In this chapter will be dealt with the strictures of large calibre—such as give little or no trouble to the patient, and which are in the anterior urethra; in Chapter XIV. the strictures of small calibre, which *do* give trouble to the patient, and which are in the same region; while Chapter XV. will be found to treat of strictures, from whatever cause, in the fixed curve, also posterior to the triangular ligament, which do or which do not require the operation of external urethrotomy.

If ever a prelude (as Webster defines it, “a light flourish or flight of music before the heavier concert or opera”) or preface was needed to a subject, the treatment of stricture should be that theme. And no better introductory words can be found—none that so well seem to suit, both for their vigor and for their soundness—those which open the little article of Dr. Stewart’s, already quoted from:

“Perhaps no subject in medicine has been so much overwritten as the diseases of the urethra. The medical journals fairly teem with its literature, contributed by all grades of medical men, from the benighted practitioner who invariably cures gonorrhœa in two days to the broad-minded specialist who is willing to admit that in this

line of work there is yet much to be learned, and that the progress made has not kept pace with that of kindred branches of medicine. A review of the past shows a lack of advancement that is certainly discouraging, and leads us to inquire why this should be so. I think that two reasons may be given :

“First, the urethra is a canal obscured from our view ; our facilities for examining it during life have been imperfect, and our opportunities for examining it after death have been neglected.

“Second, the failure of the profession at large to apply to the treatment of the urethra the same sound reasoning based upon a knowledge of pathology which they apply to the treatment of other diseases. The practitioner will invariably set the inflamed joint or muscle at rest ; he prohibits talking in laryngitis ; he prescribes opium to quiet the inflamed intestine, but he is less ready to curb his desire to meddle with the inflamed urethra. He knows that an inflammation anywhere else should be left alone and in peace, but in the treatment of the urethra such principles rarely occur to him, and, as a result, in no other place is there so meddlesome surgery, so much useless pain inflicted, and, I may add, such unsatisfactory results.

“The temerity displayed by some in the treatment of urethral diseases is astonishing ; they may not pluck up courage to open an abscess or amputate a finger, but where is the man who will not boldly thrust an instrument into the urethra ? And the less he understands about its structure and treatment, the greater his boldness and the rasher his manipulations. The brutal, unsurgical use of instruments in incompetent hands must have appealed to every surgeon, even of limited expe-

rience. In no other part is so much gentleness and delicacy of manipulation required as in the urethra, and in no other part will rudeness be attended with such disastrous results."

How well this is understood by eminent surgeons it is needless to say. The late Prof. S. D. Gross, of Philadelphia, says :

"The introduction of the catheter [sound], although apparently very simple, is one of the nicest and most delicate processes of surgery. It requires skill of the highest order, as well as the most intimate knowledge of the anatomy of the urinary organs. If I were called upon to state what I considered as the most important operation that a practitioner is called upon to perform, I should unhesitatingly say, the introduction of a catheter [sound]."

With words such as these is it needful to repress the reckless, and to stimulate the timid to a better understanding of the art of "sounding."

Examination. With gentleness ever for our motto, let us examine a patient with stricture of the variety now under discussion :

A patient presents himself complaining of an unceasing discharge, sometimes better, again worse. He may give a history of precedent gonorrhœas, or one of years' continuance, and having in your mind the conditions of chronic urethritis as described, you will remember to look for all the morbid conditions that are possible to produce the symptoms from which he suffers. After satisfying yourself that the original discharge is not continued by small meatus, urethral chancre, or an infecting sore, you will ask about frequency of urination, color of water, etc. If it is possible for the patient

to make his water into a large glass vessel, have him by all means do so, in order that, if possible, you may observe the size of the stream. Then examine for flocculi, and the condition of the water, if cloudy, for albumin by the nitric acid and heat test, and keep a specimen for microscopic examination at a later period. The patient having now passed his urine and cleared the urethra from all débris—dead epithelium, pus, etc.—is ready to have an instrument passed.

The patient now lies upon the examining-table, his apprehension being quieted by promises of gentleness, and the assurance that at the very minute any pain is inflicted you will stop all further work. Select your Otis urethrometer, or your sounds, your bougies-à-boule, and, if the latter, gauge with your eye the largest size that will comfortably pass through the meatus. Warm the instrument in a bowl of clean, warm water, and test the warmth upon your cheek or the back of your hand, in order not to burn the patient's urethra. (You may exclaim that testing upon your cheek an instrument that has likely been into all sorts of infection is risky. I feel not the least fear with *properly kept* sounds in doing so, since I know there is not a particle of infection upon them.) Then dip the point into albolene or glycerin, and gently insert the tip into the meatus. The young surgeon will find it greatly to his advantage to practise passing a sound with either hand, since the situation of a patient's bed at home may often seriously interfere with the manipulations of a surgeon accustomed to one side only. The penis is steadied at the glans with the other hand. Some hold the organ at a right angle to the recumbent body; others, nearly parallel to it. Either way has certain advantages, and no particular position

is recommended. The instruments are then passed down to the bulbous portion of the urethra, and the canal is examined as was described in Chapter X.; if contractions occur, they are to be noted as to what depth (position), size, etc. If pain is complained of at several points, note them particularly, and if you have an endoscope examine for granular spots afterward.

If you choose, you may bend your bulbous sound to the curve of one of your solid steel sounds, and pass further to examine the curve of the urethra *behind* the triangular ligament. Remember that this membranous portion, as before explained, is smaller than the other portion of the urethra, but do not be deceived by believing that if any very small instrument will pass into the bladder there is *no* stricture. The lesson we wish to teach upon this subject is a middle course. Sir Henry Thompson found in his table of statistics 67 per cent. of strictures in the bulbo-membranous region, so bear in mind that there may be contractions at this point; but he also recognized that the canal is smaller, and consequently wrote: "If a No. 10 English will pass to the bladder, there is no stricture." My own procedure is to examine with an Otis instrument or bulbous sound the pendulous urethra, and then, if there is no obstruction to that portion, to pass a conical steel sound to the bladder, and if No. 27 French will glide into that organ without force (which I never use), there is no stricture.

Supposing, now, we have discovered an actual stricture of medium calibre by one of the several means that we have at our disposal: how shall we proceed? After having discovered the stricture at the first sitting, we should do no more that day. Let the patient lie for a few moments in the office, then direct him to go home

and take a five- or ten-grain quinine pill, to keep as quiet as possible, and at the slightest sign of a chill to get into a hot bath and send at once for his surgeon. By thorough cleanliness of your instruments and good management in your technique your patient will be enabled to again present himself to you at the end of two days.

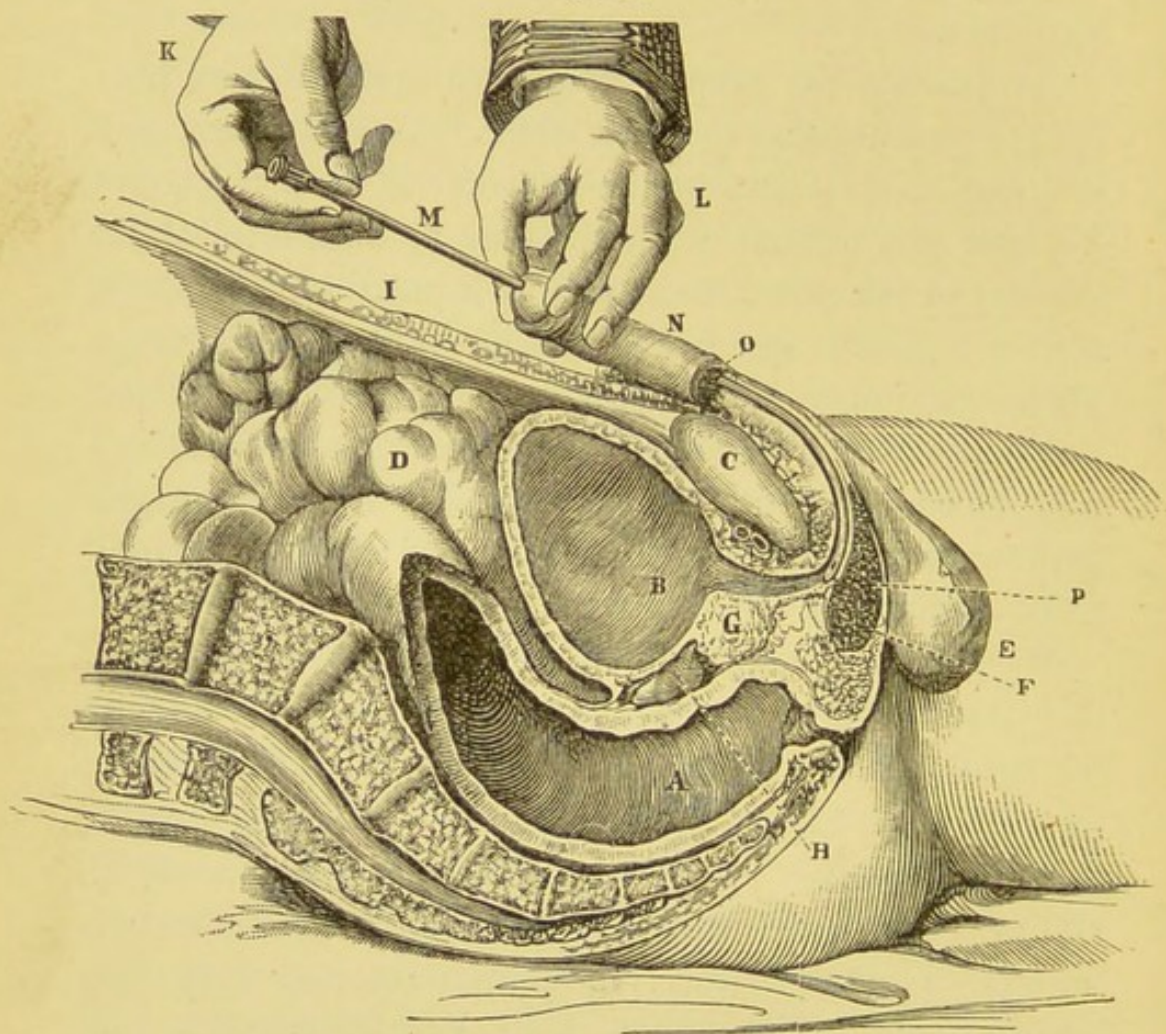
All precautions having been taken as before, you proceed to pass a sound to the bladder. And how very easy it seems to a student or the onlooker to pass a sound ! Perhaps in a normal urethra it may be simple ; but let the end of the instrument catch in a small cul-de-sac, or meet a muscular spasm, and behold the change that takes place in the manner of one who appreciates the temper and delicacy of the urethra ! He coaxes, now advancing now receding, until finally the point finds the right path, or the spasm relaxes, and onward goes the sound to its destination.

We will not describe here the full or the half *tour de maître*. Beginners or inexperienced students should try the simplest way to pass a sound to the bladder so as to give the patient the least pain and the best chance for his welfare. The sound, well warmed and oiled, and of a No. to correspond with that of the bulb that discovered the stricture, is gently inserted into the meatus ; then the sound, held lightly between the thumb and first finger, is brought parallel to the belly of the patient, and the penis is, as it were, drawn up on the sound, the latter being given a little liberty to obey the laws of gravity and fall by its own weight into the pendulous urethra.

All these manœuvres must be done with the least possible force. When you have reached the bulbous

urethra remember the advice given above under the directions for passing a short catheter, and if necessary raise the end of the instrument against the roof of the canal, draw it up a trifle and feel the point enter the opening

Fig. 27.

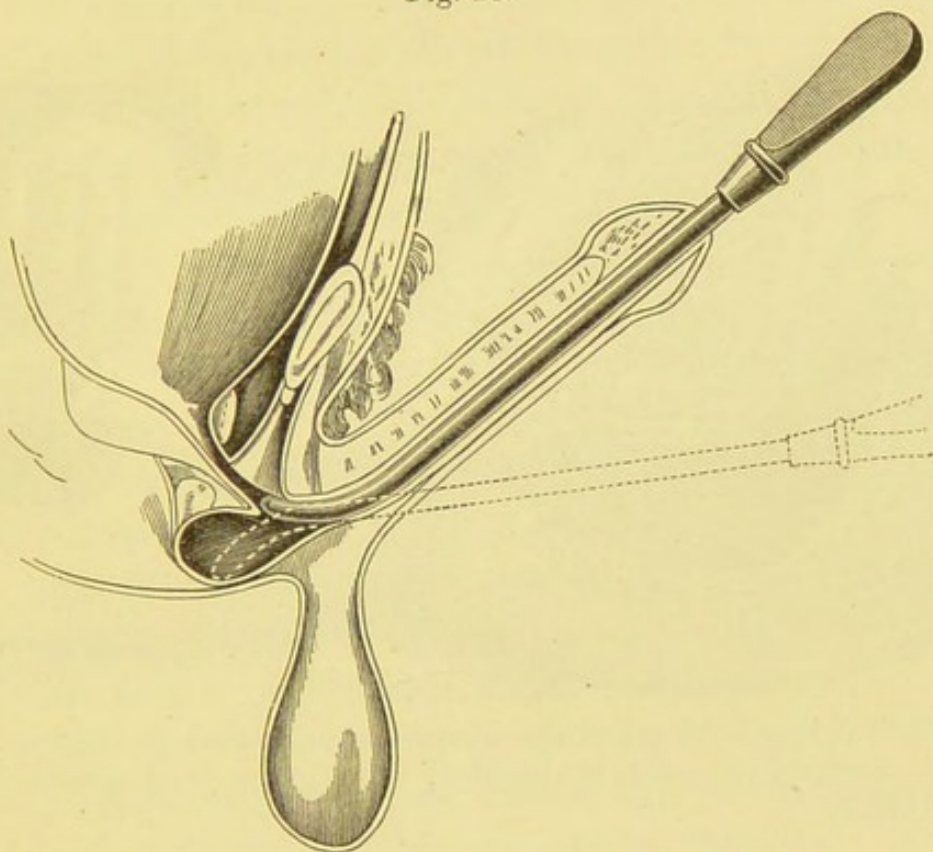


Sound introduced in the correct manner, with point at *p*, just anterior to triangular ligament, before handle of sound has been made to describe the arc of a circle.

in the triangular ligament. Here muscular spasm is most likely to be encountered, since the anterior cut-off or detrusor muscles guard the entrance to the vesical region. With a little patience, and by holding the end

of the sound against the muscles, they will give way and we are now ready for the most dangerous portion of the operation. The whole instrument must now describe a curve in order that the curved end of the sound shall describe the shorter arc of a circle under the pubic arch.

Fig. 28.

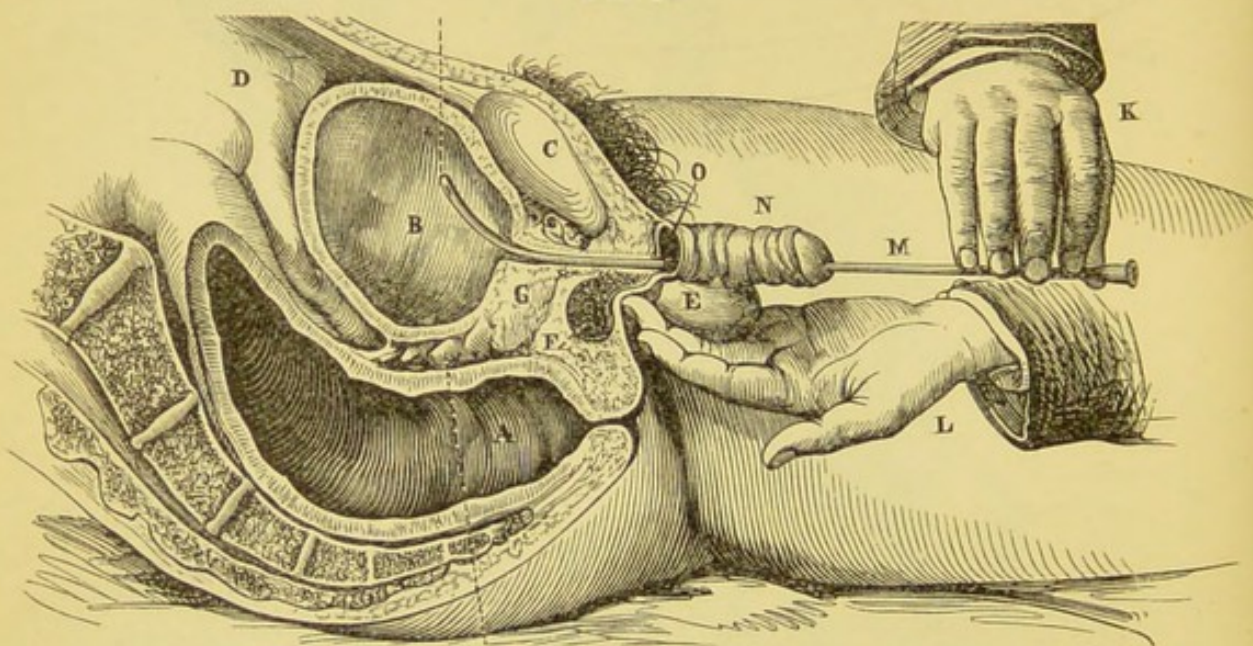


Position of sound sometimes occurring when badly entered and allowed to fall, dotted lines showing the tip in the bulb instead of in the opening of the triangular ligament.

This is done by changing hands and sweeping the handle of the sound down toward the table upon which the patient lies, or by taking fast hold of the penis, as many surgeons prefer to do, when the tip of the sound has reached the position P in Fig. 27, and thus half of the instrument is now within the urethral canal. The penis

with the sound is bent forward and downward, but care must be taken when using this method that the sound does not fall around, thereby turning the point *down* instead of *up*, as shown by the dotted lines in the cut (Fig. 28), into the bulb of the urethra, which has been grossly exaggerated to show what a space exists there.

FIG. 29.



Position handle of sound should occupy, in relation to the thighs, when correctly entered to the bladder; also showing point of sound in that organ.

Either of these manœuvres, if properly done, will allow the sound to come down between the thighs and parallel with them.

One sometimes experiences a difficulty in finding a passage for the point of the sound through the membranous urethra in certain conditions of prostatic hypertrophy. This may be rendered the easiest part of the operation of passing a sound, if the anatomy of the parts be remembered; and with the forefinger of the opposite hand in the rectum the finger-tip can guide the

point of the sound upward or to either side, thus finding the path without danger of pushing the sound into a false passage.

A friend looking at the manuscript calls my attention to the feeling of resistance frequently occurring just before the bladder is entered. Dexterous students will pass a sound with great skill and gentleness down to this point, and, having in their mind our warning "never to use force," will suddenly lose confidence in themselves and wish to hand the sound to the instructor. So soon as we feel this resistance and see the position of the sound in reference to the patient's body (handle well down between the thighs) we know that a slight enlargement of the third lobe of the prostate, or the sphincter vesicæ which guards the entrance to the bladder, stands in our way. We may here use a little force to push the handle of the sound directly toward the patient's perineum. As the point slips through the prostate it reminds one of pushing a bit of metal between two rubber balls. There is a little sense of resistance, but the sound keeps moving forward all the time. When this has been passed, the sound, without any trouble whatever, glides on into the bladder.

The bladder having been reached, the handle of the sound is generally pressing upon the glans penis, and by taking it in the fingers and gently turning it the free end will move in the bladder. There is no advantage in dilatation from leaving the sound *in situ* over a half-minute or so, for all is accomplished that is necessary by the mere passage through the stricture.

These movements are now carefully reversed, and the sound is withdrawn with as much gentleness as it was entered. Should the stricture bite the sound and hold

on to it pretty firmly, it will be better to leave it in the urethra a few moments until the spasm relaxes. The next size larger sound is now gently introduced and passed to the bladder, and the patient is then allowed to retire and instructed to take the precautions of rest and quinine.

There is probably little use passing sounds oftener than every week. Dr. Taylor's rule is three times in two weeks. Dr. Keyes advises once every seven or eight days. The reason is obvious: too much interference robs Nature of all the good resultant from the effort she has put forth. Every-day dilatation inflames the mucous membrane, which aggravates the stricture instead of soothing it. It will be well in this place to insert the rules for sounding the urethra as practised by that excellent master and careful surgeon, the late well-known Prof. Robert Ultzmann, of Vienna:

"It not rarely happens that patients with a normal urinary apparatus, for some cause or other are subjected to an exploration of the urethra, and these often experience a febrile movement which, in some cases, may lead to acute nephritis; and this may happen the easier and the oftener in those who are designedly and regularly treated by dilatation. In order to guard against such unpleasant accidents, and especially in those patients who seek office treatment, the following points should be observed:

"1. One uses only *new* or *thoroughly disinfected* sounds or bougies.

"2. At the second visit one begins with a smaller No. of sound than was used at the visit before, and waits a few moments before passing the next higher No. of sound.

"3. It should be the practice, when the stricture is dilated wide enough to admit a catheter, to wash out the bladder and urethra with a disinfectant solution in order to destroy all the schizomyces that have found entrance through the sounds.

"4. If one has wounded the urethra, which may generally be known by the blood which appears upon the tip of the sound when it is withdrawn, it is better not to go further that day, but have the patient lie down for an hour or two and not to make water during that time. . . .

"5. One should not pass a sound until he has examined the recently passed urine to see whether there has been in general a change for the worse since the last treatment. For the experienced it is sufficient to examine the specific gravity and the reaction for albuminuria with the nitric acid test. If albumin is present, or appears in greater quantities, having been present in former specimens, it is much better to do nothing at all, since one finds that the patient himself will soon observe that he feels worse, and will shortly have rigors, and a febrile movement sets in."

And thus, all through Ultzmann's works, we find gentleness, conservatism, and sound judgment advised and practised for each case considered individually.

The rule is, therefore, with gentleness and caution to pass a smooth steel instrument, taking the precautions to constantly examine the urine; to commence at a No. under the one we used last, then pass to the one last used, then to one No. higher, and, if all has gone well, to tell the patient to come back in one week for treatment again. If, on the contrary, we have reason to

believe that the patient does not do well under a routine treatment, we must use our best judgment as to how he should be treated, and never on account of pride or egotism to persist in a treatment as a certain rule because you have declared for it at first view. The wisest man may change his ideas with every circling year.

CHAPTER XIV.

TREATMENT OF STRICTURES OF SMALL CALIBRE: DILATATION VERSUS URETHROTOMY.

WHAT shall we do with strictures of small calibre? We are now prepared to answer that we shall treat them with more gentleness and conservatism than those of larger size. You may have learned to regard them as tough, gristly old fellows only to be overcome by harsh means, but pray do not let your ardor overcome your better judgment; remember what has been said about the thinning of the urethra and the subsequent ulceration behind a stricture.

First, if possible, we should locate them by passing the bulbous sound or the Otis urethrometer. If it is not possible to do this, on account of the closeness of the opening, we shall simply pass a bulb or sound down as far as possible, and then get an idea at what depth we must commence with the finer instruments. We have shown that retention may happen to those who have tolerably large strictures, from indiscretion in eating or drinking, or by catching cold from wettings, or from cold and wet feet, and that a hot bath with rest and opium relieves them. This may happen several times, until a point is reached where the stricture is too tight and too much inflamed to yield to the gentle influences of a bath and the anodyne. Should this accident happen under these conditions, and the patient has been suffering for

twenty-four to thirty-six hours with a distended bladder, what is to be done?

Our filiform instruments and graduated sizes of bougies being at hand, we must seek to effect an entrance through the stricture. If the larger sizes of bougies will not enter or pass the strictured portion, it is then necessary to practise a "wrinkle" known in Europe as Dumreicher's method (in English countries by the name of Eldridge's "Pathfinder"), which consists in filling the urethra, as before explained, with a few drachms of warmed oil, then with the fingers of one hand closing the meatus, those of the other hand "stripping" the penis toward the body in order to force as much of the oil as possible through the strictured opening. One of Gouley's bent-pointed whalebone bougies is then introduced, and if not successful in finding the opening through the urethra, a second one is pushed into the canal, and this procedure is repeated until the whole canal is filled with small whalebone and filiform bougies. Each of these in turn is tested from time to time, until finally one enters the opening of the stricture. This will give you a chance to pass a tunnelled sound, insert a larger bougie, or pass a second small instrument alongside of the successful one. Often the passage of one filiform bougie may dilate the stricture enough to enable the patient to urinate.

Time, gentleness, patience, and ingenuity are the prime factors in these cases. Quinine, rest, and the greatest care in living should be taken after these rapid dilatation séances. Unlike the rule heretofore given for the dilatation of medium-sized strictures, in a day or two we should renew the attack upon the strictured portion until we are able to pass a medium-sized bougie

preparatory to the use of steel sounds, when we dilate more slowly.

But we may be unsuccessful in relieving the patient's bladder by way of the urethra; in such a case we may either use an aspirator and tap the bladder through the abdominal wall over the pubes, or through the rectum by a curved trocar. This latter method I have never seen used, since one can always find an aspirator in the city; but in the country where the use of an instrument of this description is seldom needed, and probably *when wanted* would be out of repair, it is well to have an alternative method in mind.

The questions now arise, Will strictures once dilated remain open? Should they be cut? and if so, What have we gained? Bearing in mind what has been said of "resilient strictures" and the traumatic ones, we are prepared to answer, after having given sufficient consideration and well-seasoned judgment to the question, by saying: If the stricture is resilient (and this will include almost all traumatic strictures, for the nature of the rapidly forming new connective tissue is to contract strongly and elastically), cut well and deeply, by all means; half-measures will not suffice. We must not, however, commit ourselves to cutting in so off-hand a manner in regard to other varieties of strictures.

If one leans toward conservatism and advises dilatation in preference to cutting operations, he need not be accused of the fear of blood—"that very peculiar juice," as Mephisto observes in Goethe's *Faust*—as accounting for a marked preference for that method. It will not be to the advantage of any genito-urinary surgeon to have it said, either of his private or his clinical work, that "he never cuts strictures." We know that there

are many cases that must be cut, either on account of circumstances affecting the patient, or of an urgent necessity governed by the soundest surgical rules.

My leaning toward gradual dilatation, in doing which one commonly accomplishes by time and gentleness the same ultimate results as by cutting or divulsing, is born of experience; because, to maintain the benefits of the latter operations, the use of a sound must always be continued. I wish to enter my emphatic protest, not alone against such cutting, but against the folly that takes risks with lives by making light of urethral operations because, forsooth, they do not reach the sublime climax of a laparotomy. One's desire is to hear less of surgeons cutting, divulsing, or tearing *any* stricture under No. 30 French, irrespective of its character or situation. This mania—seemingly to win a fee or to be known as a "fearless operator"—must have taken possession of many an honest surgeon's mind.

A volume of protest has arisen from conservative men against the practice of modern meteoric writers who would teach students to believe that an internal urethrotomy of any depth under five inches was a child's-play operation, "after which the patient goes about his daily vocation."

One bold surgeon flippantly writes: "As to the particular method which was employed for internal urethrotomy: The circulation was cut off from the penis until four or five minims of a ten per cent. solution of cocaine hydrochlorate, injected with a hypodermic syringe anywhere into the tissue of the penis, had removed sensibility. The urethra anterior to the triangular ligament was then washed out with a 1:5000 bichloride solution; and the urethrometer and urethrotome, taken

out of the carbolic acid solution, were lubricated with a solution of equal parts of boro-glyceride and glycerin. Hemorrhage was controlled by external pressure and the urine was made to act as an antiseptic wash by keeping it loaded with boric acid given internally. Patients kept about their work and did not consider themselves invalids."

Hospital and private practice in genito-urinary work extending over ten years has shown me that the terrors of "urethral fever" are not half as much impressed upon students of the present day as they should be. By antiseptic measures we are escaping the results that were so frequent in the practice of older surgeons; let us not by carelessness drift into the same mortality by unnecessary operations and slighting methods.

What, it may be inquired, is to be gained by cutting stricture—except in cases of emergency, of resilient ones, of want of time, or on account of impending kidney disease, as already willingly acknowledged—when the weekly or monthly use of an instrument is as necessary to keep the urethra open as where dilatation alone was practised? The late Dr. James R. Wood, of Bellevue Hospital fame, when lecturing before the clinic at the above hospital, always warned the class not to forget to instruct a patient who had been cut or dilated for stricture (and the doctor's predilection was almost always for cutting), "to go into his bath-room each Sunday morning before going to church with his family, and carefully *pass his sound*." In a discussion which occurred some years ago between Mastin, of Mobile, and others, the question of the entire disappearance of strictured tissue after cutting operations was well argued, but the necessity of passing a sound for the remainder

of one's life was recognized by the majority of surgeons as existing, whether the stricture had been scarified or deeply cut. What can therefore be the advantage of cutting operations which place the patient in jeopardy of life, even while acknowledging the percentage of fatal cases to be small, as it undoubtedly is at the present day?

Cutting. Granted that cases occur where the patient is in a miserable state of health. From neglect, from lack of opportunity or inability to consult a surgeon, he has been tortured by frequent urination (cystitis), later by attacks of retention, by loss of sleep and all the evils that we know follow in the train of stricture. Let there be evidence of kidney trouble or not, the effort must be made to relieve the patient; and instead of building him up before the stricture is relieved, my judgment always suggests relieving by operation *first*, and then giving double attention to the details that may follow. Again, many patients with or without kidney lesions have violent chills and febrile movements, that will quickly lead to surgical kidney, after each passage of a sound; these also should be cut. Others also, who from pressing business or money emergencies have not the time to await the slower method of dilatation, may claim our attention for an operation. No other considerations than these should be listened to for a minute.

Contractions of the meatus, or any stricture under two inches from the meatus, may be operated upon under antiseptic precautions in one's office; when, however, strictures of medium or small calibre are to be cut, elaborate cautions should be taken. For a few days the patient should rest, taking only the plainest kind of food, 20-grain doses of boric acid in large draughts

of milk several times a day, opium in suppository, or other drug—enough to obtain sleep. On the day of operation no meal should immediately precede the anæsthetic.

I would be glad to recommend a local anæsthetic, such as cocaine, to be applied to the region of the stricture, but for the remembrance of several cases which have given me a bad scare; and one fatal case occurred to my knowledge after a small amount of cocaine had been used to relieve the pain and spasm previous to passing a catheter for retention. In that case the urine was only partially drawn; the patient felt badly, lay back, and in a few moments was dead. As pathologist of the hospital I made an autopsy and found all the organs apparently normal, except for the stricture of the urethra, some thickening of the bladder, and slight kidney changes. It is said that chloroform is preferable to ether in these cases; this question should be settled in each surgeon's mind before doing any operation, and no suggestion is offered on this point.

The urethra should then be washed out with a 1 : 5000 solution of mercuric bichloride and cut with an Otis urethrotome, or if this will not pass, Prof. Otis advises the use of a small Maisonneuve instrument with which to cut to a size sufficient to introduce his own urethrotome. The cutting should always be on the *roof of the urethral canal in the absolute middle line*, and never on the floor, for fear of cutting through the urethra, nor to one side. When this has been done, a clean sound lubricated with boro-glyceride should be passed to the bladder (this supposes only one stricture; if more than one are present, clean bulbous sounds lubricated with the glycerin should be used to locate the deeper ones,

and these should be divided). The bladder and urethra should now be irrigated with a mild solution of the bichloride, 1 : 10,000 boiled water, or saturated solution of boric acid, warmed in either case.

All hemorrhage must be checked by cold or pressure either over a clean catheter or on the Otis hæmostatic tube, if necessary. If the cut has been made in the exact middle line there will not be much bleeding and but little danger of infection, since the fasciæ joining in that region have but few lymphatics and bloodvessels. In England and on the Continent it is customary to tie a catheter into the urethra, but in this country the better plan is pursued of leaving everything free. The urine from a bladder disinfected by the washing described and the boric acid internally administered, is as harmless as any other bland fluid, and does not the least injury in the wound.

After a couple of days a sound one size smaller than the urethra was cut to should be passed to the bladder, and the next larger size then introduced. It is said that by cutting or divulsing a stricture, you get a *splice* in the hardened tissue that has encroached upon the lumen of the canal. In the first instance this is true, but, as in the case of all other new connective tissue, you must keep this "splice" stretched or it will in time re-contract to the original condition.

CHAPTER XV.

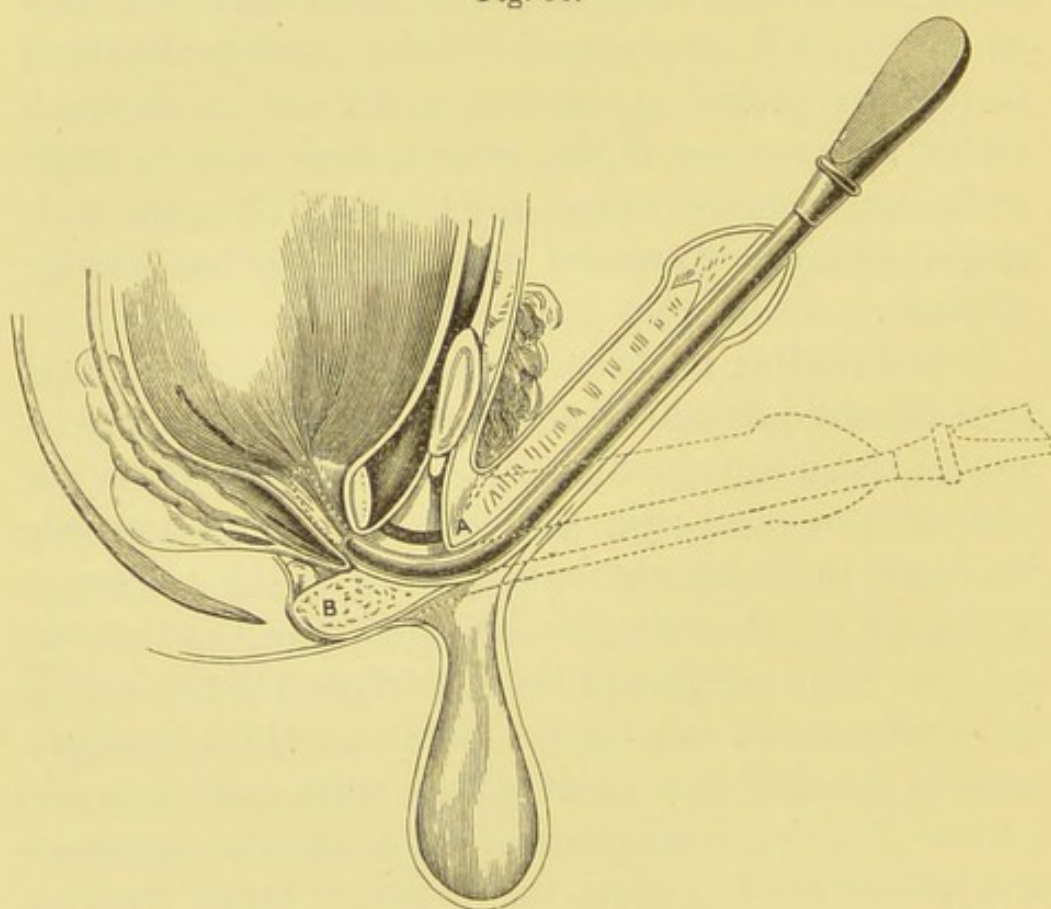
STRICTURES POSTERIOR TO THE TRIANGULAR LIGAMENT.

CASES of stricture posterior to the triangular ligament which do not need external urethrotomy may be said to be entirely different from the classes already discussed in the two preceding chapters, and they are as much within the province of the general surgeon as is other work not included under specialties. The reason is plain: the conditions of the parts are so widely different.

Before reading the ensuing pages, the anatomy of the parts involved should be well studied and fixed in the mind. Turn to pages 128 and 130, and observe, in the representations of the two positions of passing a sound, the depth to which the bulb reaches in the perineum (F, Fig. 27). Opposite the bulb (as drawn in the cut, and above and anterior in the subject) is the triangular ligament and the arch of the pubis, to which the ligament is attached above and at both sides. As a consequence of the rigid structure of the triangular ligament and the surrounding parts, the urethra is firmly fixed to these parts and is not movable, as is the "pendulous" part. This part of the urethra, therefore, is spoken of as the "fixed curve" of the urethra, and must not be thought of as strictly a part of the anterior urethra, although anatomically speaking it is so. Behind this portion, at the junction of the bulbous urethra with the

adjacent part of the canal posterior (bulbo-membranous junction), is the membranous urethra, which perforates the deep perineal fascia; two layers from this membrane are prolonged around it, the one forward, the other backward; it is also surrounded by the compressor urethræ muscle. This is the narrowest portion of the canal. Posterior to this, and *higher up in the body*, is the prostate gland.

Fig. 30.



A. The triangular ligament split into two portions (exaggerated and enlarged). The black line represents the dorsal vein lying in the roof of the canal at this particular point. B. The spongy bulb—showing that it cannot drain into the urethra.

The *triangular ligament* of the urethra is a dense fascia (deep perineal fascia) which closes the outlet of

the pelvis anteriorly, and *through which* the urethra passes by a circular opening about one inch below the under side of the pubic arch. Immediately above this aperture passes the *dorsal vein of the penis*, and on either side externally the pudic nerve and artery. In Fig. 30, taken from Gray's *Anatomy* and modified somewhat to suit myself, I have tried to show all these points, in order to make clear to the student why certain operations are nowadays adopted, why older ones have been discarded; to show at what a height the bladder is above the perineum—therefore out of the way in operations for external urethrotomy; the reason that internal operations are so dangerous in the deeper part of the urethral canal, and the advantage and simplicity of external cuts over any other procedure.

With a clear understanding of this special region, it will be only necessary to describe the pathological conditions which we have to face in order to see at a glance what should be done to relieve them.

If it be found impossible to relieve stricture of the urethra in the "fixed curve," or in the anterior portion of the membranous urethra, by dilating with bougies and conical steel sounds—and only after repeated, careful, conscientious and futile attempts to dilate it and keep it patent—we may propose the more serious operations.

Divulsion was but the makeshift for cutting. In the anus after prolonged stretching by my thumbs I have made tears that were as straight, deep, and clean-cut as if done by a knife, and this is purely an analogous case. The only idea of divulsion was to tear the stricture instead of cutting it, for two reasons: divulsion tears and does not cut vessels which would otherwise bleed smartly; it also sunders tissue so that the wound is not so deep.

It is not known precisely where the tear will occur, but the chance of infection is just as great as if cut. Look again at Fig. 30, and you will see that below is the bulb (B), composed of cavernous tissue like that covering the urethra—simply an expansion of it, richly supplied with bloodvessels. To cut into this portion of the urethra in the dark with a cutting instrument that is in the best hands uncertain as to its depth of action, *means hemorrhage*—hemorrhage enough to scare the stoutest-hearted surgeon in many cases; how much more must it terrify the one who is not accustomed to much surgery!

Again, turn to any of the older works, and where internal urethotomy is spoken of, one is warned to cut in this locality upon the *floor* of the urethra instead of on the roof as in the pendulous portion. Why? “Of two evils choose the lesser.” Upon the roof immediately above the urethra and in the triangular ligament lies the great dorsal vein of the penis, and the pudic arteries and nerves. Necessarily we must not encroach upon these, or we shall have more serious hemorrhage from this source than the other. Therefore when we divulse, we tear in the hope that the split may come somewhere, only not in the great vessels, and if it *should* happen above, the vein may roll out of the way. But, though the tear or cut be made in the mucous membrane on the floor of the urethra, there is always a chance for septic infection; not that the urine poisons the system unless the bladder and kidneys have been much affected—in which case the passage of a sound may cause urethral fever as well as may an operation—but where there is granulation going on in such a foul region as the inflamed and ulcerated mucous membrane, there is bound to be

pus, and in this particular pocket-like space in the urethra there is but little chance for its escape.

Modern surgery has provided a plan of relief for these troublesome questions in

External urethrotomy. This is hazardous, but the disease is also severe. The operation should not be undertaken by inexperienced hands. The varieties known at present are perineal section *with* or *without* guides, the former being comparatively easy when contrasted with the latter, which is one of the most difficult operations in surgery. These will be found in the Surgeries; they are mentioned here only incidentally, to show what is done in case the stricture is in the "fixed curve" of the urethra, or posterior in the membranous portion. After the urethra is opened upon a whalebone bougie or upon a staff, if pervious, or without a guide if not patent, the surgeon searches with a guide for an opening into the urethra anterior to the opening made in the canal by his perineal cut, and then, by passing the knife forward and downward, relieves the strictured portion of the canal. The wound can be packed with iodoform gauze, and all hemorrhage controlled with a pressure-bandage over all or by the perineal crutch; meanwhile the bladder discharges through the perineal wound, as does the opened urethra in front, while the patient is in the recumbent position. A tube may be used in the bladder to drain it if preferred. The scrotum should be strapped up out of the way after the operation, otherwise there may be some infiltration into the tissues, as the external perineal fascia leads forward into that appendage.

It may be mentioned *en passant*, that the urethra must be opened in some cases for rupture of the urethra

and extravasation of the urine. Extravasation of urine from rupture of a urethra which has become ulcerated and thinned behind a stricture, is known by hardness in the perineum, by a feeling of something giving way, and a sense of relief from the retention, followed by diminution of the pain for a short period; finally, renewed severe pains, chills and febrile symptoms. If the quantity of urine which escapes from the ruptured urethra be great in amount, perineal abscess follows. If small quantities at various times, then fistulous tracts in time appear, and the bladder is relieved in this way. All of these conditions are treated of more fully and in detail in the newer books upon surgery than one could expect to detail in a small work upon genito-urinary matters alone. As before said, this third class belongs not less to the general surgeon than to the genito-urinary specialist. Such severe cases as are complicated by infiltration of urine, fistulæ, ruptured bladder, etc., are seldom seen in private practice. It is at the hospitals as general surgeons that we expect to see cases of neglected stricture come for treatment, or the cases of recent traumatic rupture with subsequent urinary fistulæ.

It is not within our province to treat of the enlarged prostate in elderly persons, and the subsequent bladder involvement. One imagines that bladder diseases are sufficient to fill a book by themselves.

LIST OF INSTRUMENTS FOR GENITO-URINARY SURGERY.

It has been thought expedient to make a list of instruments which are really useful and necessary for those who propose to practise genito-urinary surgery.

This list includes only those instruments really needed for actual work, and is made with due regard to expense, an important item with many of us.

An outfit for a genito-urinary surgeon who desires to treat simply affections of the urethra, which does not include perineal section for the purpose of external urethrotomy, or lithotomy, should consist of the following:

Two Ultzmann short-curve catheters. (Fig. 6, page 70.)

Two feet of rubber tubing with hard rubber attachments for nozzle of syringe. (See page 70.)

One hard rubber H. H. & Co. syringe.

One Ultzmann deep urethral injection catheter with syringe. (Fig. 9, page 75.)

One Dittel's "porte remède." (Fig. 10, page 75.)

Set of (2 or 3) hard rubber endoscopic tubes with obturators and brush. (Fig. 5, page 59.)

Otis endoscope and tubes, with battery. *Not positively necessary.* (Fig. 4, page 54.)

Otis urethrometer and Otis urethrotome (new model). (Fig. 25, page 113.)

Sounds, bougies-à-boule, No. 12 to No. 32 French.

Steel sounds, conical points, nickel-plated, Otis modified short curve, No. 18 to No. 35 French, inclusive; or if considered too expensive as a first outlay, alternate Nos. of the French scale.

Scale-plate.

Half a dozen whalebone filiform guides, bent points. (Fig. 23, page 109.)

Half a dozen filiform bougies, French and English make.

Four Mercier catheters, elbowed, English.

Two or three feet of rubber tubing, for irrigation in connection with the preceding.

Two or four Tiemann "velvet eye" catheters, Nos. 12, 14, 18, and 22 French.

Bougies, English and French, Nos. 4 to 20, inclusive.

One straight probe-pointed bistoury for meatotomy.

Small hard-rubber syringe for injecting oil into urethra.

CHAPTER XVI.

CHANCROID : "INFECTING" AND "NON-INFECTING" SORES.

IN this work, designed to be essentially practical, but little space can be devoted to theoretical conditions. As a nation we do not care for the ultimate rootlets of knowledge—we wish to grasp the convergent point where the rays centre, we desire that truth that will do us the most good in the very shortest time. On this principle we shall here condense as much as possible the subject now to be presented, in order to save the hard-worked practitioner the time and the mental concentration otherwise necessary to grasp its history and its theoretical points.

The determination of the question of the "unity" or "duality" of venereal sores must be sought elsewhere; it will be sufficient to explain what is meant by these two terms.

About the year 1495 a frightful pest broke out in Naples. It was considered to have been brought to that place by the army of Charles VIII., who had invaded the country. By contact with the soldiers the whole population became more or less infected with this disease, which soon spread through the whole of Europe.

Horrible ravages were produced wherever this disease appeared, and as in other epidemics, where the greatest number were affected the greatest severity of symptoms and effects were felt. The disease was said to produce

swellings, sores, *buboes*, bones falling apart, and all the other disgusting details that an ignorant people could imagine by which to describe it. Gradually out of chaos came a little order: the disease abated a trifle and intelligent observers began to notice that one or both of two forms of venereal sores followed contact, although the specific effects were not at first noted, and up to the middle of the present century a belief in the same cause for all venereal sores ("unity") was universal.

In 1831, Ricord and some other writers had by experiment and close observation remarked that some sores remained local, while others were followed by constitutional effects.

In 1852, Bassereau revolutionized the world of syphilography by demonstrating that there was a radical difference in the generating source of the two species of sores. By numerous experiments and confrontations he showed that the contagion from a soft sore was followed only by a local lesion, while infection from a hard sore was invariably followed by symptoms of constitutional syphilis ("duality").

In brief, the dogma of duality declared that—

The simple or soft chancre develops from a like lesion, *has no period of incubation*, remains local, furnishes an inoculable pus which is auto-inoculable or can be conveyed to others, whether syphilitic or not.

The syphilitic chancre originates from a hard or indurated sore (as a rule); *has a well-marked period of incubation*; is followed by progressive constitutional effects, and is only inoculable upon a non-syphilitic subject.

As time went on it was found that a strict interpretation of this theory of dualism would not account for

certain conditions, as, for instance, where a soft sore in the beginning later became hard or indurated, and constitutional syphilis followed.

Again, some sores have been found hard from their first appearance and no syphilis followed; or, *vice versâ*, a sore commencing soft and running its whole course as such, might be followed by constitutional syphilis.

For a long time it was considered as sufficient evidence that a sore was simple (soft chancre—chancreoid) because of its *auto-inoculability*, that is to say, if the secretions from a soft sore were transplanted upon the point of a lance to some other portion of the same body, or of another person's body, a like sore might be produced, and from this second sore a third, and so on, until many others had been vaccinated from the parent sore; but it was remarked that as the vaccination went on many times in the same body the effects grew gradually less—the system becoming saturated, as it were—until at last no sore resulted from continued vaccinations. Unfortunately, in some cases where an *apparently simple sore* was vaccinated upon another person it was followed by syphilis.

We were now ready to change our opinions as to the duality theory; so many changes had taken place since 1852 in the study of syphilis that surgeons began to look for further cause of infection than simple pustular action. The sores began to be recognized as “infecting” and “non-infecting” sores.

It is now believed that a venereal sore may be hard or soft according to the tissue it occupies and the conditions of its surroundings.

It is possible for a chancroidal sore (non-infecting) to develop *de novo*, either from a simple ulcer which has

in some way become infected by chancroidal bacteria developed by whatever means that virus may need for its culture; or, from the *top* of a sore which has for its deepest base a true infecting sore. The double character of the sore (mixed sore) renders it possible for two or more persons to contract, the one syphilis and the other chancroid, or both.

The belief is that heat, moisture, and acrid juices, such as are found in the region of the genitals, constantly bathing or influencing the parts, are alone necessary in order to convert a non-inflamed sore into an ulcerating chancroid. It must not be inferred that syphilis has ever been developed from the inoculation of a soft sore which was *purely soft*; but only in such cases as above described, of a sore with a syphilitic base and a soft apex. The lower portions of the sore, and especially *the blood*, have in such cases been removed in the implantation from the original subject to another person.

From what we already know of the evil influences of uncleanness, lack of hygiene, and immorality, coupled with the behavior of venereal disease as demonstrated by experiment, we are prepared to say positively that the non-infecting sore—chancroid—never produces syphilis, but that its contagious principle is a pathogenic virus entirely distinct and independent of the syphilitic poison; and instead of being developed solely from the juices or virus of a like chancroidal sore, may be generated *de novo* from syphilitic and other sores which have been acted upon by external agents to produce inflammation the products of which have become infected by a germ (as yet we know not what) which is capable of changing the character of the ulcer.

Although the term "chancroid" is used in this chapter, the author prefers that of "non-infecting sore," as opposed to the "infecting sore" or chancre, since we have seen that the descriptive terms *hard sore* and *soft sore* are no longer believed to clearly and truthfully define syphilis and chancroidal virus. The terms "chancroid" and "non-infecting sore" are here, then, interchangeable.

Diagnosis of chancroid. "We may say that chancroid is a local venereal ulcer essentially inflammatory in its nature and destructive in its action. It is especially characterized by its development without incubation, its tendency to the production of suppurating buboes, and its almost unlimited capacity for inoculation, both upon the bearer and upon other individuals."¹

The consideration of incubation is a matter of the utmost consequence in making a diagnosis between the infecting and the non-infecting sores. An instant's thought will convince you that there are factors in the consideration of the *time element* that must be of account before we can safely make a positive diagnosis.

Keep in mind the number of connections the patient may have had before consulting you, and their antecedent dates: you will immediately perceive that the appearance of the sore for which your patient seeks advice may be an ulcer which has had a period of incubation of weeks, although the patient supposes that the lesion first showed a day or two after his last coitus.

The contagiousness of the chancroid is one of its most characteristic elements.

We spoke of its power to auto-inoculate the bearer

¹ Morrow, in *Atlas of Skin and Venereal Diseases*.

of the disease, or by contact with an abraded surface to convey it to another ; for example, two mucous surfaces—as the foreskin in contact with the glans penis, the latter being the first site of the ulcer, by the apposition of the two surfaces.

Mediate communication may be effected by dirty instruments, towels, soiled linen, etc.—whatever brings the discharges against an area of uninvaded tissue. The pus-cells are the transmitters of the virulence, since, when filtered, the plasma is harmless.

Chancroidal pus mixed with other pathological secretions is still active, as when a urethral chancroid complicates an acute gonorrhœa.

Bubo. Almost constantly present after chancroid of the penis, the bubo demonstrates that the poison is absorbed by the lymphatics, but, unlike that of syphilis, is arrested at the first gland, which almost invariably swells and becomes suppurating—the ulcer left after opening a bubo being in all respects like the original sore and capable of further inoculating the patient or others. When a gland becomes inflamed by reason of the storage in its meshes of the pus of a chancroidal ulcer, suppuration is inevitable. Crossed action of the lymphatics of the penis is sometimes very marked, the ulcer being situated upon one side of that organ and the bubo appearing in the opposite groin ; or one coming in the middle line may occasion a bubo in either groin.

A great many cases of syphilis are not venereal in their origin ; not so with chancroid, however—it is the most venereal of all venereal diseases. Mediate contagion plays but a small part in its spread ; direct venereal contact is the general mode of transmission. A few cases here and there may be traced to carelessness on the

part of the surgeon, but it very seldom occurs in an innocent manner, as is often the case with syphilis.

Usual sites. In the male, the glans penis and the prepuce are the most prevalent situations, although the ulcers often occur upon the skin of that organ in any portion of its length, some appearing at the root of the penis, amongst the hair.

Urethral chancre must not be forgotten ; as a rule, these sores are not deeper than the fossa navicularis.

Females suffer most in those parts that are liable to contact and injury by the introduction of the male organ ; the site of selection is usually upon the introitus vaginæ, labia majores and fourchette. The vagina proper is seldom attacked, although the cervix and uterine cavity may be the seat of a sore.

As an abrasion upon the skin or mucous membrane invites the inoculation of chancroidal pus when brought into contact with such places, it naturally follows that in women the posterior fourchette and the anus may easily become affected through the virus running down over these parts. In men, infection of or about the anus *may* occur, but is of very rare occurrence, since unnatural crime is uncommon among us as a nation. The scrotum, from being bathed in sweat and acrid discharges amongst the vile and degraded, often suffers largely.

Sores may be single or multiple ; the single are more commonly met with.

There is no particular reason why one situation should be more spoken of than another, except on the frænum, where the ulcer generally erodes the whole bridle, sometimes causing pretty severe pain and hemorrhage ; and

in the urethra, when the discharge may be mistaken for an attack of gonorrhœa.

A simple chancreoid ulcer upon a tissue whose normal condition is soft, and whose construction is of loose-meshed areolar tissue, may run its course almost as any other simple ulcer.

The *beginning chancreoid* appears first as a reddened blush; then a papule, with an ever-increasing areola; on the second or third day a vesico-pustule forms, which, when the top is broken, discloses the typical ulcer below, shedding pus pretty freely, and looking at the edges sharply cut, as if punched out of the skin.

The same sore upon a denser tissue, or exposed to friction or great filth, quickly becomes inflamed, the base hard and extended, and at once the diagnosis between infecting and non-infecting sore becomes difficult.

Prognosis. An untreated chancreoid seldom heals in less than a month. The larger the size the slower the repair, other things being equal. Gangrenous sores last for months, according to the health and circumstances of the patient. Chancreoids of the meatus, constantly irritated by urine and friction of the clothes, are also slow in repair.

Old sores on the vulva, perineum, or anus, bathed in acrid secretions, tend to last as ulcers for years, as also do chancreoids of the preputial orifice. I once circumcised a man who had had a succession of sores upon the rim of the preputial orifice that had lasted for years. Every time he had an erection or coitus, the little ulcers split open in radiating lines that again became infected, until, when I saw him, he could not possibly retract the prepuce, which was as thick and hard as a piece of sole-leather. Careful circumcision, under precautionary

measures, gave a good result by first intention in a few days.

Chancroid may become *gangrenous* or *phagedenic*. If the former, then large areas of tissue may be rapidly swept away; even the whole glans penis, or the whole or part of the prepuce and skin covering the penis. I remember a case in the hospital where a gangrenous chancroid had attacked the whole penis, which at once was denuded of the outer covering from the corona to the root of the organ, and was left a bleeding, granulating wound. If gangrene attacks a chancroid, it performs by natural means what we seek to accomplish by artificial measures—as by the application of acid to form a slough. When this falls, the ulcer underneath is clean and granulating.

Phagedena is molecular death—*i. e.*, only small particles of tissue die at a time, so that instead of being an aid to Nature by checking the poisonous principle from destroying large areas of tissue at once, a slow death goes on and helps infect the system, while small areas are constantly being involved in its corroding action. It might be likened to the action of a drop of acid on a piece of cloth where the capillarity of the cloth draws the superfluous acid from the centre to the periphery, and destroys each fibre with which it comes in contact. Phagedena may last for months, destroying tissue and structures in advance of its original inoculation-point. As might be easily imagined, gangrene and phagedena are not at all essential elements of chancroid, but are the result of constitutional and local vices. Whatever causes lower the general health, as forms of misery and depraved living, alcoholism, anæmia, and old age, are prominent as general causes.

A general, sweeping assertion may be made that lack of cleanliness is one of the greatest propagators of the above-mentioned conditions, as of chancroid itself. The lower the class of prostitutes and the filthier the men who cohabit with them, the worse will be the type of infection. It is enough to draw attention to this fact to know intuitively that gangrene and phagedena are not specific forms of the disease, but may be grafted on a sore originally benign.

CHAPTER XVII.

SORES SIMULATING CHANCROID—TREATMENT OF CHANCROID.

HAVING presented chancroid in its several forms, we can imagine how many other varieties of local sores may simulate it. In whatever book one may open on this subject, the first comparison is sure to be with *herpes pro genitalis*. Whoever has had the similarity pointed out to him will instinctively bear in mind the very great resemblance between them. As we claim, moreover, that chancroid may develop *de novo*, this narrows the definition to still smaller confines. It is not meant to say that when the herpes has already become chancroidal it is still herpes, but the gradual transition may be unmarked, and what has begun as a pure herpes from a neurosis may develop into a full-fledged chancroidal ulcer, as auto-inoculable as a sore starting as a chancroid from actual vaccination.

The herpes upon a woman's genitals are pretty apt to be multiple, deeply excavated, shedding an abundance of pus, the edges red and inflamed, pus but lightly inoculable, glands in inguinal region but little swollen; as a rule, a history of previous attacks, with no signs of the scars of former buboes. It is mortifying to the woman to inquire when she last had sexual connection, and then to find perhaps that she possesses a hymen; one must bear in mind, if but for charity's sake, the

possibility of herpes when called upon to diagnosticate such sores.

Men with long and tender prepuces and those who do not wash frequently are also subject to herpes, and to balanitis, and as such are liable to all the changes above described. Herpes generally appears as a small vesicle which itches intensely at first, and this is a good point in diagnosis.

Mucous ulcers and patches under certain conditions will resemble chancroid, but you will learn by experience to know them with but little trouble.

Never pronounce for chancroid, however clear the diagnosis may seem to your mind, until you know all about the patient and have had him under observation for a length of time.

Amongst the most constant positive signs of chancroid is the swelling and rapid suppuration of a lymphatic gland in its neighborhood. It is not meant to imply that the glands invariably form buboes; rather to accentuate the fact that when a "non-infecting" sore of the genitals appears which rapidly enlarges, and in a few days one or more of the inguinal chain of glands painfully inflame, the diagnosis of the character of the sore is confirmed at an early date. This suppuration of the glands is a *bubo*, and is almost certain to go on to suppuration.

Treatment. Various methods have been proposed to abort chancroidal buboes. Ice poultices, compression—compressed sponges which are put on dry with a spica and are then wetted, exercise a large amount of pressure—green soap rubbed into the swelling, tr. iodine in colodion, injections of iodine, carbolic acid, iodoform in ether, have all been thoroughly tried, with lurid fail-

ures as a result. Personally, I never attempt to abort a chancroidal bubo. I poultice them immediately their character is made out by the rapid swelling and area of redness and the presence of a chancroidal sore. Be sure that you have to do with a *chancroidal* bubo, as there are buboes of other varieties which act in a different manner.

The pus-sac, after having been thoroughly poulticed, may be opened by aspirating and washing out with the solution hydrarg. bichlor. 1:2000, or hydrogen peroxide, or may be incised—parallel to Poupart's ligament or vertically—and the abscess cavity thoroughly drenched with the latter solution 1:2 or 1:4 in water, the site of the swelling being packed with iodoform gauze.

If these cavities are not thoroughly poulticed and have not been well supplicated before opening, there remains much tissue in a half-necrotic state that must be scraped out with sharp spoons before packing. Healing, as a rule, is somewhat tedious.

After granulation is well started with iodoform, it is well to change to the balsam of Peru as a stimulant.

The treatment of a chancroid—if at all virulent—must be with vigor. Nitric, chromic, or carbolic acid should be thoroughly applied to the ulcer until all parts are well cauterized. If nitric acid is used, the sore must be well dried by bibulous paper or lint, having taken the precaution to apply some 10 per cent. solution of cocaine hydrochlorate to deaden the pain before the acid is applied. This is to be done by means of a glass rod or a wooden tooth-pick, the excess of acid being wiped off by a moist sponge, or else some strong soap-suds may be poured into the sore. The latter is then dried and lightly dressed, when iodoform, aristol, iodol,

or calomel should be sprinkled over the granulating surface which the fall of the eschar has left. Chromic acid is a valuable means of attacking chancre, but is too widespread in its action without great precaution. For the lightest cases carbolic acid is all that is needed; its local anæsthetic properties make its use especially valuable.

Of dressings, for stimulating the sores and keeping in check the growth of specific cocci, the order of enumeration above holds good. Iodoform is best of all, if it was not for its villainous smell, always associated in the minds of the public with a venereal disease. No other drug would be needed, and although bacteriologists tell us that "bugs" are not killed by its use, still they almost invariably keep very quiet—intoxicated by the smell, perhaps. Aristol is new and ranks next to iodoform. Iodol is of very little power, as a rule. There may be idiosyncrasies, however, which prohibit the use of anything but calomel, oxide of zinc, or salicylic acid.

Iodoform in some persons causes the most terrible eezemas, and poisons others very badly. It is well to remember the following precautions and rules for its use: Only the smallest amount sufficient to cover the sore in a thin layer should be used. When granulations appear healthy, iodoform should be omitted, and some non-poisonous substance, preferably hydronaphthol or balsam of Peru, substituted. In the case of elderly persons or of children, special caution should be used, as *toxic* symptoms are apt to appear even though very small quantities of this agent may have been used. The toxic effects are—increase of temperature, which may rise to 104° F. and above; frequency of pulse, which

may rise to 150 to 180; physical depression, headache, loss of appetite, and the odor of iodoform in the breath. These cease when the use of the agent is discontinued.

Salicylic acid is said to destroy the virus of chancroid, but I have never seen it of any benefit.

No pastes or mercurial salves should be used, as these greasy compounds only serve to extend the trouble.

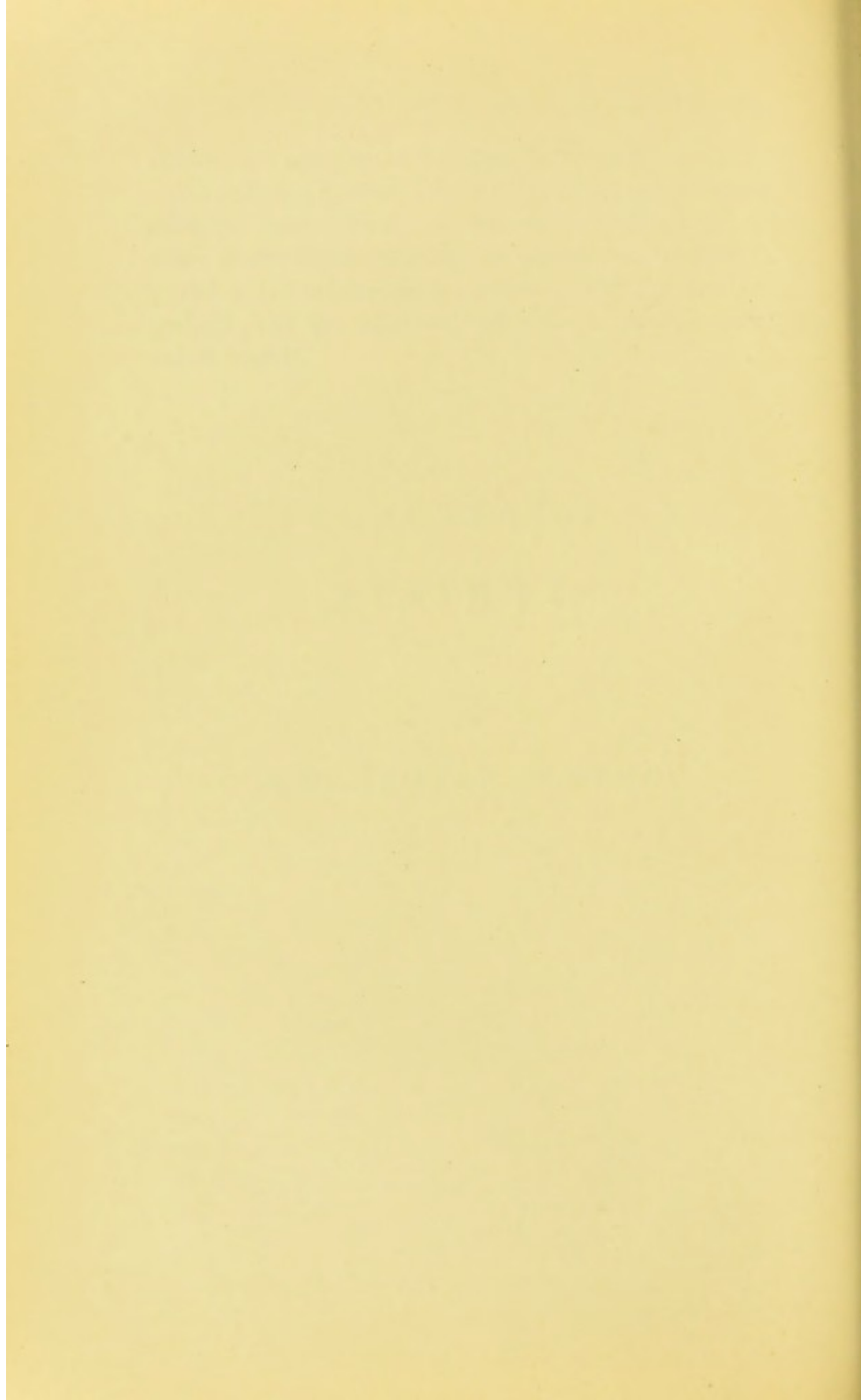
There is no need to describe separately the treatment suitable in the case of each special part liable to be attacked. With the general instructions already given, common sense will indicate the mode to be employed in the different cases. Should the sore attack the frænum, for instance, one can readily see that the hole made in the thin membrane will leave the artery upon its lower border exposed to slight injuries, when it may rupture, causing perhaps serious hemorrhage. The artery ought, therefore, to be snipped and the ends tied, or a ligature tied about the artery so that it may slough through; the hole is then converted into a plain surface and has a better chance to heal. If phimosis complicates, one naturally uses washes, such as those recommended under the subject of balanitis in the first chapters (pages 37, 38). Then after the cul-de-sac of the prepuce has been dried by cotton, some powder, such as iodoform, etc., is to be applied by means of applicators on or as near the sore as possible. If the disease is attacking the parts in contiguity and the discharges are being retained, it will be necessary to slit the foreskin under antiseptic precautions and treat the sores locally when they are exposed.

Urethral chancroid is best treated by pencils composed of cocoa butter or gelatin holding in their substance iodoform and balsam of Peru, or bismuth, oxide

of zinc, and salicylic acid. After the chancroid has been cauterized, the urethra should be swabbed out by cotton pledgets, and a pencil of the above inserted several times a day, remembering to caution the patient to attend to the subsequent contraction which the scar will undergo, and the need that will arise to have it either cut or dilated.

PART II.
SYPHILIS.

BY
JAMES R. HAYDEN, M.D.



SYPHILIS.

CHAPTER I.

INTRODUCTION.

SYPHILIS is a chronic, infectious, and constitutional disease. Entering the system by means of the blood-vessels and lymphatics, it attacks primarily the connective tissue, and may in its course affect every tissue and organ in the body.

The disease is characterized by an increase of the connective-tissue cells, and by the development of a new tissue, called granulation or gummatous tissue, which is composed of cells resembling white corpuscles.

By some observers syphilis is thought to be caused by a microörganism, but up to the present time no specific bacillus has been positively demonstrated in all syphilitic lesions, and therefore no uniform results or positive conclusions have been obtained.

Lustgarten, in the year 1884, discovered a bacillus in two cases of initial sclerosis and in a syphilitic gumma; he describes the bacilli as slightly curved rods, situated in the interior of nucleated cells. Other investigators have found different microbes in syphilitic lesions, which they claim to be the cause of the disease.

There are two forms of syphilis—the *acquired* form

and the *hereditary* form; both are due to the same virus, but differ in their course, lesions and symptoms.

Acquired syphilis is communicated by a syphilitic person to one free from the disease; the point of inoculation being always marked by the initial lesion.

Hereditary syphilis is transmitted *in utero* from one or both parents and in this form there is no initial lesion.

As a rule, syphilis occurs but once in the same individual, but reinfection may take place, as is shown by several well-authenticated cases of second attacks.

The course of syphilis may be divided into *three stages*—the primary, the secondary, and the tertiary; but it must not be forgotten that in a large number of cases tertiary lesions may occur in the secondary stage or *vice versâ*, or that lesions of these different stages may be present at the same time, thus showing that the disease does not invariably follow these sharply defined periods.

The *primary stage* consists of two periods of incubation. The *first period of incubation* exists from the time of infection to the appearance of the initial lesion, and, as a rule, lasts fourteen to twenty-one days; but may be as short as ten or as long as seventy days. This is immediately followed by the *second period of incubation*, which dates from the formation of the initial lesion to the development of constitutional manifestations, and usually occupies forty to forty-five days, but may be prolonged to sixty or even seventy days.

These two periods of incubation make up the primary stage of syphilis; the duration of which is from fifty-five to seventy days.

The lesions of the primary stage are—the initial lesion, and the glandular and lymphatic indurations. The lymphatic glands and vessels in anatomical relation with the initial lesion become indurated from about the tenth to the fourteenth day.

The *secondary stage* of syphilis, or the stage of constitutional manifestations, now begins, and is characterized by superficial lesions of the skin and mucous membranes, as well as their dependencies, and by affections of the eyes and the lymphatic glands. The duration of this stage is variable, and depends greatly upon the treatment, the habits, and constitution of the patient.

The *tertiary stage* of syphilis is not as frequently observed now as formerly, owing to the improved methods of treatment during the first months of the disease. It manifests itself by gummous, tubercular, bullous, and ulcerative lesions; also by affections of the nervous system and viscera.

SOURCES OF CONTAGION.

The secretion of the initial lesion is contagious.

The secretions of the secondary lesions, the blood, and the lymph, in the secondary stage, are contagious. The physiological secretions, such as the tears, milk, saliva, and sweat are innocuous, unless mixed with blood or primary and secondary secretions. The semen is innocuous upon a cutaneous or mucous surface, but may transmit syphilis to the ovum.

It is doubtful if the secretions of the tertiary lesions are contagious.

MODES OF INFECTION.

Syphilitic infection may be either *direct* or *mediate*.

Direct infection takes places most frequently from the genitals of one person to those of another during coitus; also in unnatural practices between persons of the same or opposite sex.

Mouth-to-mouth infection, as in kissing, is not infrequent.

Surgeons, dentists, and midwives are very liable to infection on the fingers, and should therefore exercise great care in handling or operating upon syphilitic subjects.

Mediate infection is that form in which the syphilitic virus upon any article is transferred to a healthy person. The agents of transfer may be cigars, pipes, tooth-brushes, pencils, chewing-gum, handkerchiefs, whistles, drinking and eating utensils, razors, towels, toys, surgical operations—dressings, instruments, etc. Glass-blowers are often infected, as a number of men use the same pipe. Vaccino-syphilis is rarely encountered at present, owing to the substitution of bovine for human virus.

Syphilis is precisely the same disease and pursues essentially the same course, whether derived from a primary or secondary lesion; in both cases the initial lesion being the hard chancre.

CHAPTER II.

THE INITIAL LESION OF SYPHILIS.

THE initial lesion of syphilis is also called the chancre; the hard, indurated, infecting, or Hunterian chancre; the initial sclerosis; the primitive or initial neoplasm, and primary syphilitic ulcer.

It originates in the secretions of primary or secondary lesions, appears at the end of the first period of incubation, and is always situated at the point of entrance of the syphilitic virus. As a rule there is but one initial lesion, although several may be present at the same time.

Chancres found upon the genital organs are called *genital chancres*; those situated elsewhere upon the body are designated as *extra-genital chancres*.

Most frequently the initial lesion occurs upon the genitals, but may be situated upon any part of the body—as upon the lips, the tongue, the tonsils, the eyelid or conjunctiva, the fingers, the pubes, or the breasts.

There are four forms under which the initial lesion may appear at its *beginning*.

First. The chancrous erosion.

Second. The silvery spot.

Third. The dry papule.

Fourth. The umbilicated papule or follicular chancre.

The *chancrous erosion* is the most common form. It begins as a small spot of excoriation, dark-red in

color at first, but finally becoming coppery red. The surface is smooth and polished and destitute of granulations. The secretion is serous and scanty. As a rule there is but a single erosion; exceptionally there are several, in which case they are called the "multiple herpetiform chancres of Dubuc."

The *silvery spot* is generally situated upon the glans and at the meatus; it is pin-head in size and silvery white in color, as if the mucous membrane had been touched with pure carbolic acid or nitrate of silver. The lesion increases slowly, and is finally replaced by a smooth, shining surface typical of chancre.

The *dry papule*, or "*papule sèche* of Lanceraux," is always in a dry condition, as its name implies. It is generally single and begins as a dull-red spot. The surface is flat or convex, brownish-red in color and destitute of secretion. In some cases the papule subsides, while in others it becomes exulcerous.

The *umbilicated papule* or *follicular chancre* is a rare form of the initial lesion; commencing as a small pinkish elevation with central depression, it increases in size and assumes a red color.

Beginning in any of the above forms, the chancre finally develops into a superficial erosion, with sloping sides, red or copper-colored floor, scanty serous secretion, and situated upon and surrounded by a circumscribed mass of induration.

Infecting balano-posthitis. This is still another form under which the initial lesion sometimes appears, and may be mistaken for simple balano-posthitis. The prepuce is infiltrated, its mucous membrane thickened, deep-red in color, and slightly excoriated. The glans

penis may or may not be eroded. In some cases the induration is evenly distributed, in others it is localized.

Induration. The induration of the chancre is a peculiar hardness of the mucous membrane and cellular tissue around and beneath the sore. It is due to a deposit of granulation tissue, which takes place without acute inflammation, and which is sharply defined at its circumference from the surrounding structures. The *amount* of induration varies greatly and depends a good deal upon the site of the chancre; it is always well marked in the sulcus behind the corona glandis, at the meatus or on the corona, but is absent or very slight on the glans itself, owing to the rich network of capillary vessels and scarcity of connective tissue. As a rule the induration remains until the chancre has healed, although its duration is largely influenced by appropriate treatment.

Parchment induration is that variety of induration in which the deposit is superficial and confined to the superficial layers of the mucous membrane.

Relapsing induration. At any time during the course of syphilis indurated nodules may appear on the genitals; they are either superficial or deep, and may be mistaken for primary lesions. These nodules have been observed as early as the first or as late as the tenth year of the disease.

Secretion. The secretion of the chancre is serous in character, unless the sore be irritated, when it is rendered purulent.

Duration. The duration of the chancre varies in different cases and depends upon the treatment. It may remain until after the development of the secondary symptoms.

Termination. As a rule the site of the chancre is not marked by a cicatrix, but by a purplish-red spot, which in time fades to white.

The *lymphatic glands* in the immediate neighborhood of the chancre are indurated, painless, freely movable upon and separate from each other, and rarely suppurate. The overlying skin remains normal in all respects.

The *lymphatic vessels* become indurated about the same time as the chancre, and run from it toward the nearest group of glands. They are hard and cord-like, and devoid of all acute inflammatory symptoms.

The following table shows the situation of the enlarged glands in relation to the chancre :

Chancres of the genital organs; of the integument in their immediate neighborhood, or of the anus.	Inguinal glands.
Chancres of the lips and chin.	Submaxillary glands.
Chancres of the tongue.	Subhyoid glands.
Chancres of the eyelids.	Pre-auricular glands.
Chancres of the fingers.	Epitrochlear and axillary glands.
Chancres of the arm and breast.	Axillary glands.

DIFFERENTIAL DIAGNOSIS OF THE CHANCRE AND CHANCROID.

<i>Chancre.</i>	<i>Chancroid.</i>
Has a period of incubation; generally two to three weeks.	Has no period of incubation.
Is usually single.	Is usually multiple.
Looks like a superficial erosion.	Is "punched out" and excavated in appearance.
The edges are sloping.	The edges are undermined.

Chancre.

The floor is smooth, red or copper-colored.

The secretion is serous and rather scanty.

The induration is cartilaginous and sharply limited.

The neighboring lymphatic glands are indurated, painless, freely movable beneath the skin, not matted together, and rarely suppurate.

Chancroid.

The floor is uneven and "worm-eaten."

The secretion is purulent, copious, and auto-inoculable.

There is no induration, but the sore may be surrounded by a zone of œdematous infiltration, not sharply limited.

If the neighboring lymphatic glands are involved, they form an inflamed, painful mass, which usually suppurates; the skin becomes red, tender, and hot.

CHAPTER III.

THE SECONDARY PERIOD.

IN some subjects the commencement of this period is marked only by cutaneous lesions (syphilides), while in others there are various constitutional disturbances, such as fever, headache, neuralgia, pains in the bones, muscles or joints, insomnia, and anæmia.

Syphilitic fever varies considerably in different cases. It is most marked in women and nervous subjects, and may be either intermittent, remittent, or continued in character; as a rule it is higher at night and just prior to the appearance of an eruption, after the development of which it usually subsides spontaneously. The fever may be accompanied by chilly sensations, or even a well-marked chill, and followed by mild or profuse sweating; there is a corresponding acceleration of the pulse and respiration. Syphilitic fever is uninfluenced by quinine, but yields readily to mercurial treatment.

Neuralgic pains in different parts of the body, headache, and pains in the bones, joints, tendons, and muscles, which become worse at night, are very common at this period of the disease.

Insomnia, accompanied by various delusions, is sometimes met with, especially in women.

Anæmia during this stage is frequently encountered, generally in run-down and debilitated subjects. There is a marked increase in the number of white blood-

corpuscles, with a corresponding decrease in the number of red corpuscles.

The skin and mucous membranes are very susceptible to irritation and inflammation, as may frequently be observed in the slow healing of wounds and scratches in syphilitic subjects.

Syphilitic analgesia consists in the loss of the sense of touch, of heat or cold, and of the perception of pain. It occurs in men and women, but most frequently in the latter sex. In some cases it extends over the entire body, while in others it is restricted to certain regions. Its favorite localities are the dorsal surfaces of the fore-arms, the hands, the ankles, and the feet. Beginning during the early secondary period, syphilitic analgesia usually lasts for several months.

CHAPTER IV.

THE SYPHILIDES.

THE syphilides constitute the various lesions of the skin which may appear at any time during the course of syphilis; these syphilitic eruptions are caused by localized hyperæmia and cell-infiltration. The hyperæmic or erythematous syphilides are peculiar to the early stages, while those due to cell-infiltration appear later. The infiltrating cells are round, granular, nucleated bodies, resembling white blood-corpuscles, and very similar to the cells found in the initial lesion and the later gummatous tumors.

The course of the syphilides is chronic, and marked by the absence of acute inflammatory symptoms. As a rule, there is no pain, itching, or irritation.

Very commonly several varieties of lesions are present at the same time; this occurrence is due to the chronicity of the syphilides, and their tendency to relapse. Their color, which is at first pinkish-red, finally fades to a brownish-red, copper, or "lean ham" color; these pigmentary changes are probably due to a deposit of the coloring matter of the blood in the affected spots.

Relapses, particularly of the erythematous and papular syphilides, are apt to assume a circular or ring-shaped form.

THE ERYTHEMATOUS SYPHILIDE.

(*Synonyms*: "Syphilitic erythema," "syphilitic roseola," "macular syphilide," "syphilis cutanea maculosa," or "syphiloderma erythematosum.")

The erythematous syphilide is usually the first eruption to appear, and exists in all cases of syphilis, but may be so faint in some as to escape observation. The lesion consists of round, oval, or irregular spots of hyperæmia with a diameter of from one line to half an inch. Their color varies from a delicate pink to a decided red or even purple hue. In some cases there is only a mottling of the skin, or the eruption is so faint as to be invisible except on careful examination. Exposure to cold brings the spots into view, and this can be accomplished by applying alcohol to the surface, or having the patient undress in a cool room. At first the spots disappear on pressure, but at about the end of the first month they assume a permanent coppery color.

As a rule, the eruption appears first near the umbilicus, then spreads over the trunk and extremities, especially on their flexor aspects; the dorsal surfaces of the hands and feet are rarely invaded, but the spots are very persistent on the palms and soles, where they may form scaling patches. On the back the eruption follows the obliquity of the ribs, from the median line outward. When it occurs on the scalp it is usually accompanied by alopecia. On the genitals of either sex, the macules may hypertrophy, and thus form condylomata lata; the same is true if they are situated about the anus, the umbilicus, the nose, the mouth, or in the folds beneath and between the breasts. If the face be involved, the

eruption is most marked about the nose, mouth, chin, and especially on the forehead at the border of the scalp, where the macules form the so-called "corona veneris." The eruption on the face is generally covered by fine scales of epidermis or yellowish-white crusts.

With this eruption we may have condylomata lata, alopecia, affections of the nails, slight periostitis, or even osseous lesions, and scaling of the palms or soles. Iritis is rare, but may occur at this period.

Where surfaces of skin are in contact with each other the confluence of spots may form superficially ulcerating patches, with a foul secretion.

The course of the erythematous syphilide is slow, and its duration depends upon the degree of hyperæmia and the treatment. Relapses are common during the first year, and when they occur, the eruption is generally localized, and very apt to be circular or ring-shaped.

This syphilide may be confounded with measles, scarlatina, or the erythema caused by cubebs, oil of sandalwood, and copaiba, or the eruption occasioned by the internal or external use of mercury.

THE PAPULAR SYPHILIDES.

The lesion of the papular syphilides consists of circumscribed cell-infiltration into the integument. It is sometimes the first eruption of the secondary stage, or may occur simultaneously with the erythematous syphilide, or even as late as the tertiary period.

There are two varieties of the papular syphilide: the *conical* or *miliary* papular syphilide, and the *lenticular* or *flat* papular syphilide.

THE CONICAL OR MILIARY PAPULAR SYPHILIDE.

This syphilide has two varieties: the *large conical* or *miliary* papular syphilide, composed of large papules, and the *small conical* or *miliary* papular syphilide, composed of small papules.

The *large miliary papular syphilide* is less common than the small variety, and is frequently associated with it. The papules are conical, red in color at first, but finally assume a coppery hue. They rarely appear in large numbers, and are generally scattered over the body. The papules are most profuse on the back and buttocks, the front of the thighs, the face, and the back of the neck. They are very prone to pustulate and degenerate into ulcers.

In *small miliary papular syphilide* the papules are about the size of a pin's head, round or conical, sometimes umbilicated, and of a deep pinkish-red color. They are grouped either in the form of circles, segments of circles, or like the letter S or figure 8.

The eruption begins about the face, and thence invades the entire body. Frequently some of the papules are converted into vesicles or pustules, by the formation of serum or pus on their apices. When the papules occur on the scrotum and penis, they are usually transformed into condylomata.

The course of the eruption is chronic, and requires local as well as internal treatment.

THE LENTICULAR OR FLAT PAPULAR SYPHILIDE.

There are two varieties of this syphilide: the *small lenticular* or *flat* papular syphilide, composed of *small*

papules, and the *large lenticular* or *flat* papular syphilide, composed of *large* papules.

Small lenticular or flat papular syphilide. In this form the papules begin as little red spots, and rapidly increase in size to one-eighth or even one-quarter of an inch in diameter. They are round or oval, with flat surfaces and sharply limited margins. The papules first appear about the shoulders, the back of the neck, or the sides of the thorax, and are rapidly followed by others on the face and the front of the neck; the trunk and body generally are then invaded, and on the back the eruption follows the course of the ribs. They are especially numerous on the flexor aspects of the extremities and near joints. The supra- and infra-clavicular regions are not invaded. They are more numerous in the palmar than on the dorsal surfaces of the hands.

If the papules extend below the knees, they are sparingly distributed on the inner surfaces of the legs, and sometimes on the soles. This syphilide frequently spares the face, but it may form the so-called "corona veneris."

The color, which is at first a pinkish-red, soon becomes coppery; on the legs it may be purple, owing to blood-stasis or effusion.

The amount of scaling varies greatly in different subjects, and on the various parts of the body.

The scales on the papules are small, adherent, and *not* silvery-white in color. Under mercurial treatment this eruption disappears rapidly, but leaves copper-colored spots of pigmentation.

A relapse of this syphilide may occur at any time within two years after infection, and the papules then tend to form circles, or segments of circles, on the

elbows and knees, and may be accompanied by papules on the shoulders and trunk.

Large lenticular or flat papular syphilide. Commencing as small spots, the papules increase rapidly in size; they are elevated, sharply defined and covered with small scales; in diameter they vary from three-eighths of an inch to one inch. The color, which is at first red, soon becomes coppery. Their course is chronic. This syphilide really belongs to the middle and late periods of the secondary stage, is rarely seen as the first eruption, but frequently appears as late as the second, and even the third year.

The eruption consists of a large number of papules scattered irregularly over the body. Upon moist surfaces these papules become excoriated, and transformed into condylomata with a foul secretion, as between the toes, around the umbilicus, at the margin of the nostril, on the perineum, and about the genitals.

Under mercurial treatment the papules are slowly absorbed.

When this syphilide becomes chronic, and the papules occur in limited numbers, it may be mistaken for psoriasis.

SCALING PAPULAR SYPHILIDE OF THE PALMS AND SOLES.

Scaling papular syphilides of the palms and soles, also called syphilitic psoriasis of the palms and soles, may occur at any time during the secondary period, or with tertiary lesions.

Their course is chronic, painless, unaccompanied by itching, and readily influenced by mercurial treatment.

The well-marked scaling syphilides of the palms and soles may appear as early as the third month, or much later. At first, the papules are elevated, sharply defined, and of a deep-red color; they increase in size, fuse together, and form irregular patches, which constitute true syphilitic psoriasis of the palms and soles.

There is a general thickening of the epidermis, with scaling and redness of the surface; in severe cases the furrows of the hand may be converted into painful fissures, or "rhagades," which are liable to last for months or for years. This affection may extend along the fingers to the nails, which become brittle and thickened. If the process continue, there may be a general cornification of the epidermis of the palm or sole, which becomes perforated with small holes, from which can be extracted chalk-like masses of epidermis; this condition is known by some as "syphilis cutanea cornea." The lesion requires constitutional, but especially local mercurial treatment.

THE PUSTULAR SYPHILIDES.

These syphilides may appear at any time during the secondary stage, or even as late as the tertiary period. The pustules vary in size, from a pin's head to a ten-cent piece; are round or oval, and surrounded by a coppery halo. They may begin as papules or pustules. In some cases they cover the entire body, while in others they are limited to special regions. Relapses are very common. The crusts of the small pustules are greenish-brown in color; those of the larger and later ones being greenish-black, of firm consistence and somewhat adherent. Beneath the small crusts there is little if

any suppuration, but under the larger ones there are well-marked ulcers, secreting thick, brownish-yellow pus.

THE SMALL PUSTULAR OR ACNE-FORM SYPHILIDE.

This is a papulo-pustular syphilide, and attacks the sebaceous and hair follicles. It consists of small, conical, or slightly rounded pustules, which may form the entire eruption, or be accompanied by a papular or erythematous syphilide.

The appearance of this eruption is usually attended by fever, which may last days, or in some cases weeks, the temperature varying from 90° to 100° F.

The color of the bases of the pustules is at first bright red, but rapidly becomes brownish-red. The apices of the pustules are first yellow, but the pus is soon changed into a greenish-brown, somewhat adherent crust.

In some cases the pustules are transformed into small ulcers; in others they run together, forming complete or partial rings.

The eruption usually begins about the face, the scalp, the back of the neck and the shoulders, and may then invade the entire body, but is most marked upon the scapular, sternal and gluteal regions, and on the outer aspects of the extremities.

This syphilide generally appears from the third to the sixth month of the secondary period, and may run a very chronic course; it relapses usually as a larger pustular or tubercular syphilide. The pustules leave small brown spots of pigmentation which disappear in a few months, or cicatrices which destroy the hair follicles, thus producing permanent alopecia.

THE LARGE PUSTULAR OR IMPETIGO-FORM SYPHILIDE.

This is a pustulo-crustaceous eruption, having a tendency to involve large areas of surface, and to become serpiginous in character.

It usually appears about the middle or latter part of the first year of the disease, but may occur earlier or later.

Most of the pustules are about the size of a pea or larger, and found upon the hairy parts; seldom on the hands and feet.

The eruption commences as red spots, which are soon transformed into pustules; these are covered by dark-brown adherent crusts, which may run together, thus forming patches that attain a diameter of several inches; this is well seen on the face, at the margin of the scalp, in the scalp itself, about the *alæ nasi* and commissures of the lips, upon the chin and in the beard.

In some cases the eruption becomes serpiginous, generally upon the upper extremities; it extends by a ring of ulceration, covered with a crust, and enclosing a healed area of skin. This serpiginous process may be either *superficial* or *deep*, according to the amount and depth of tissue it destroys. In neglected and untreated cases, the ulceration may cause great destruction of tissue, especially upon the face and head; this is rarely seen, however, if the patient receives early and proper treatment. Healing occurs under the crusts, which fall off, leaving smooth, red surfaces that remain pigmented for several months.

This eruption is rarely present with the erythematous syphilide, but is not uncommon with the papular variety;

it generally occurs in debilitated subjects, or in those who have neglected early treatment.

THE VARIOLA-FORM SYPHILIDE.

This is a much less common eruption than the acne-form variety, and resembles variola and varicella.

It is composed of round, superficial pustules, beginning as red spots, which in a day or so are converted into pustules. The pustules are surrounded by a deep-red areola; when fully developed they become umbilicated. In about a week, greenish-brown, slightly adherent crusts are formed, beneath which is an ulcerated base.

They run a chronic course, do not increase in size, but in severe cases may run together.

They occur where the skin is soft and delicate, as upon the forehead, and at muco-cutaneous junctions, and are rarely found in the palms or on the soles.

The eruption begins about the face, and spreads over the rest of the body.

When the crusts fall off, their former sites are indicated by spots of pigmentation.

THE ECTHYMA-FORM SYPHILIDE.

There are two forms of this syphilide—the *superficial* and the *deep*.

The *superficial* eruption may appear at any time during the first year of syphilis, and consists of pustules; these begin as red elevations of the skin, which are soon transformed into pustules; these increase in size, and are covered by round or conical crusts of a yellowish-

brown color. Beneath the crust is an ulcerated surface, which secretes a thick pus.

The pustules generally appear first about the scalp, particularly at its junction with the face and neck, and in a short time invade the various parts of the body, as the anterior surfaces of the legs and forearms, the trunk, and the inguinal and gluteal regions. The pustules may be disseminated, grouped in patches, or arranged in the form of circles or segments of circles. In some cases they leave cicatrices, while in others they do not.

The *deep* form of this syphilide is as a rule a late manifestation, but may be precocious, and is then very malignant.

The eruption begins as round or oval elevations, upon which pus forms; this dries into a blackish-brown crust, having beneath it a deep, sharply defined ulcer, which when healed leaves a white cicatrix.

When the eruption is matured, it consists of an encrusted papulo-tubercle, from one-quarter to one-half an inch in diameter and surrounded by a coppery-colored zone.

It is most marked upon the anterior surfaces of the legs, the arms, about the face, and on the lower portions of the trunk.

The eruption is developed very slowly and in successive crops.

RUPIA.

The eruption consists of ulcers covered by laminated crusts. It may appear during the first year of syphilis, but is usually a late manifestation of the disease.

There are two varieties of rupia : one in which the

crusts are small, numerous, and scattered; another, in which they are larger, less numerous, and grouped together.

The lesion begins as a red spot which is transformed into a flat pustule; this soon dries into a small greenish-brown crust having beneath it an ulcerated surface, the secretion from which forms another and larger crust under the initial one; this process continues, each crust being larger than the preceding one, until finally we have a conical, laminated, brownish-black, hard, adherent crust, beneath which is an undermined ulcer, with a foul purulent secretion, and surrounded by an area of redness.

The *small* eruption begins about the face or the forearms, and may then invade the trunk and the lower extremities.

The *larger* eruption is most common on the face and trunk, but may also appear on the extremities.

The lesion is generally single, although several may be formed at the same time.

The resulting cicatrices are shining white, are depressed, and surrounded by a brownish line of pigment which remains for several months.

THE BULLOUS SYPHILIDE.

This syphilide begins as an effusion of serum beneath the epidermis, and becoming turbid is finally converted into pus. The pus gradually dries into an adherent greenish-black crust, beneath which is an ulcer.

The bullæ vary greatly in size, and are surrounded by a red areola. They generally occur on the forearms

and legs, but may also invade the trunk, and are then most marked upon the chest.

This is usually a late manifestation and runs a chronic course.

THE TUBERCULAR SYPHILIDE.

The tubercular syphilide consists of circumscribed or diffuse infiltrations involving the entire thickness of the skin.

It really belongs to the tertiary period, but may be developed early in the secondary stage.

The non-ulcerative or resolute tubercular syphilide occurs in two forms: first, as sharply defined, conical, or rounded tubercles, and second, as more or less elevated, flat, sharply circumscribed, and often scaly patches. As a rule, these lesions do not ulcerate.

First form. The conical or rounded tubercles vary in size from one-third of an inch to an inch or more in diameter, and are deeply seated in the derma. They begin as pinkish or dark-red spots, and eventually become deep, circumscribed tubercles of a pinkish-red, coppery, or brownish-red color. On the face they have a smooth, shining surface, with little or no scaling, but upon other regions they are frequently covered with large adherent scales.

If this syphilide appears in the secondary period, it usually invades the entire body, but if it occurs later it shows a tendency to attack the face, the forehead, the scalp, the back of the neck, the shoulders and scapular regions, the thorax, and especially the back, the gluteal regions, the outer aspects* of the extremities near the joints, and the backs of the hands, very rarely the

palms and soles. When developed upon certain regions this eruption occurs in groups, which may be either circular or irregular in outline. On the forehead it may form the so-called "corona veneris."

Sometimes upon the face one or more tubercles coalesce, forming a patch, which rapidly increases in size along its circumference, while atrophy and absorption take place at the centre—in this way producing an elevated circle enclosing a central depressed patch of atrophied tissue.

On the body the course of this syphilide is practically the same as upon the face.

Second form. This consists of flat, sharply circumscribed, deeply seated patches, and is less frequent than the first form. It commences as small red spots, which increase in size from one to two inches in area. The tubercles are slightly elevated, and look like patches of thickened and reddened skin covered with scales, and surrounded by a narrow areola of redness. They have a marked tendency to relapse.

Their course is chronic, lasting weeks, months, and even years.

Exceptionally they form circles or, if irritated, patches, which may increase at the periphery and atrophy at the centre.

On parts subject to friction or pressure the tubercles sometimes ulcerate.

THE GUMMATOUS SYPHILIDES.

There are two varieties of these syphilides—the *early secondary* or *precocious gummata*, and those occurring late in the disease, and called *tertiary*.

Of the early secondary or precocious gummata there are three varieties: the generalized, the localized, and the neurotic.

The *generalized variety* may appear as early as the eighth week or as late as the middle of the second year of the disease.

It begins as small circumscribed swellings beneath the skin, which soon adhere to it and form bright-red spots about the size of a bean. As they increase their color becomes coppery. When fully developed they are firm in consistence, and are then said to be in the stage of condensation; as they mature they become softer and pass into the stage of softening.

If the disease progresses favorably these lesions do not ulcerate, but resolve, leaving spots of pigmentation.

This eruption may be general and involve the entire body. Its favorite sites are the arms, the forearms, the back, the chest, the gluteal regions, the thighs, and the legs.

If ulceration takes place the tumors become dark-red in color and fluctuating, the integument is destroyed, and thus is revealed an unhealthy, undermined ulcer, secreting sanious pus.

The *localized variety* usually appears about the fifth month or within the first year, and in some instances even later. The tumors are the same as in the first variety, except that they are larger and more indolent.

The eruption is generally found on the head, the face, the pharyngeal walls, the mouth, the forearms, and the legs, but may also be met with upon the trunk, the arms, and the thighs.

These tumors, likewise, have the stages of condensa-

tion and softening; they may either be absorbed or ulcerate.

The generalized and localized varieties of gummata occur in elderly, debilitated, and alcoholic subjects.

In the *neurotic variety* the syphilide appears during the very early months of the disease, is preceded or accompanied by severe neuralgic or rheumatic pains in the joints or muscles, and by general malaise and debility. There are flashing, burning pains, either intermittent or continuous, at the sites of the lesions. There is also some rise of temperature, loss of appetite, and emaciation. The tumors generally occur on the forearms and legs, but may be found upon the shoulders, the arms, the thighs, the chest, and the trunk.

This eruption consists of two lesions; first, of oval or round tumors, or irregular plaques, and second, of tumors situated in the subcutaneous tissue and freely movable beneath the skin and upon the fascia.

The tumors begin by infiltration into the skin and connective tissue; at first they are bright-red, round or oval, circumscribed swellings, which soon become raised above the level of the surrounding integument.

In some cases the bright-red color becomes darkened into a blackish-red, in others into a deep bright-red, and again in others the centre becomes white, and is surrounded by a deep-red border.

Some cases resolve, others ulcerate, and if the latter be the case, the resulting cicatrices are usually superficial.

LATE OR TERTIARY GUMMATA.

These lesions belong to the late stages of the disease, and consist of circumscribed tumors.

The eruption is composed of a small number of lesions whose course is slow and painless. It generally occurs on parts where the connective tissue is loose and abundant.

When the lesions are subcutaneous they are *gummos* or *gummatous tumors*, but if they ulcerate and involve the skin, they are called *gummatous ulcers*.

This syphilide has three stages: the stage of tumefaction, the stage of ulceration, and the stage of repair.

It commences as small, painless, movable nodules, about the size of a pea, and situated beneath the integument. As they increase in size they form adhesions with the skin, periosteum, and fascia.

The integument over the nodules is at first red, but finally becomes coppery red and much thickened.

The lesions are true gummy tumors, varying in size from that of a pea to several inches in diameter, more or less convex and surrounded by an area of inflammation. They are prone to develop in groups, and may either fuse together or remain isolated. The tumors may remain solid for weeks or months, and with proper treatment undergo resolution, but as a rule they degenerate, in either of the following ways: by ulceration, which may occur on the skin and involve the entire lesion, or the new growth may soften and cause ulceration in the skin. The resulting ulcer is similar in shape to the tumor, the floor is uneven, reddish-green or greenish-black in color, and secretes sanious, fetid pus. The edges are sharply cut, perpendicular and surrounded by an inflammatory areola.

The cicatrices, which are thin in some cases, but thick and rough in others, soon lose their coppery color, and become white.

The course of the gummata is very chronic. This syphilide may occur on the scalp, the face, or the neck ; its favorite sites are on the extremities, near the joints, the back more frequently than the chest, very often upon the gluteal regions, rarely upon the lower part of the abdomen, never on the palms or soles.

The ulcers may become serpiginous, phagedenic, or gangrenous.

THE SERPIGINOUS SYPHILIDE.

There are two varieties of this syphilide—the superficial and the deep.

The *superficial* serpiginous syphilide belongs to the early period of syphilis, and begins as a pustule ; a crust forms upon it, beneath which is a superficial ulceration ; the crusts fall off except at the periphery, where they form a ring, the enclosed area being oval or round in shape and hyperæmic. Beneath the ring of crusts is a corresponding ulcer, surrounded by an inflammatory areola. The ulcerative process extends, being covered by the crusts, while the central portion cicatrizes. When ulceration ceases, it leaves slight atrophy of the skin, and copper-colored pigmentation.

The *deep* serpiginous syphilide originates in one of the late or tertiary lesions, such as a tubercle, an ecthyma-form pustule, or an ulcerating gumma.

Changes similar to those in the superficial variety take place, until there is developed a red cicatrix surrounded by a wide ring of greenish-black crusts, beneath which is an ulcerating, ring-shaped surface.

This syphilide is rather rare and chronic in its course, sometimes occupying years.

It causes little pain, and usually occurs on the inner surfaces of the arms and forearms, upon the breast and the legs.

The resulting cicatrices may be thick or thin, and if situated near joints they are liable to cause permanent deformity from their contraction. The pigmentation finally fades, leaving white scars.

THE PIGMENTARY SYPHILIDE.

This syphilide occurs in the early months of the disease, and consists of brown or yellowish-brown spots or patches.

There are three forms of the pigmentary syphilide.

The *first form* consists of sharply defined or irregular spots or patches, of a yellowish-brown or brown color, which is unaffected by pressure. They vary in size from that of a pea to an inch or even more in diameter, are not elevated, do not scale, and may remain for weeks or months.

The *second form* occurs as a diffuse pigmentation, and is more common than the first variety. It usually begins on the sides or the back of the neck, and thence invades the chest and back for a short distance. The color varies in different subjects, from a light *café-au-lait* to a light-brown or even brown hue. Upon the surface of a patch appear several small, round, oval, or irregular white spots; these increase slowly, in some cases becoming whiter than the normal skin, while in others they are of the same color.

This condition lasts for several months, then disappears, leaving the parts in a perfectly normal condition.

The *third form* consists of an abnormal distribution

of the pigment of the skin, and is the least common of all.

The normal color of the integument becomes white, in spots of irregular size and shape; the spots are surrounded by a dark border, which becomes deeper in color as the white spots increase.

After a period of several months the skin resumes its normal color.

The lesion may appear as early as the second or third month, but usually occurs at the sixth month, and during the second or even the third year.

It is more common in females than in males, and usually appears before the thirty-fifth year; it is also quite rare in older persons.

This syphilide is generally situated upon the neck, and especially its sides, less frequently upon the forehead and face, but may also appear upon the flexor surfaces of the extremities.

Mercurial treatment, either local or constitutional, has little if any effect on this lesion.

MALIGNANT PRECOCIOUS SYPHILIDES.

By malignant precocious syphilides are understood certain eruptions, which, having a malignant ulcerative tendency, appear early in the course of the disease, and are accompanied by general cachexia.

Pustular eruptions, particularly the impetigo-form and the ecthyma-form syphilides, and, less frequently, the papular eruptions, are prone to assume these characters. Such complications generally occur in debilitated subjects and those addicted to alcoholic stimulants.

These syphilides are divided into three classes: the

syphilide puro-crustacée ulcéreuse, the *syphilide tuberculo-crustacée ulcéreuse*, and the *syphilide tuberculo-ulcérante gangréneuse*.

The *syphilide puro-crustacée ulcéreuse* is a pustular eruption, accompanied by ulceration and crust formation. It commences as pustules, which ulcerate and form greenish-black crusts; the ulcers are deep, and have a foul purulent secretion. Beginning upon the face or scalp, it extends to the arms, and may eventually invade the entire body.

The *syphilide tuberculo-crustacée ulcéreuse* begins as small tubercles, which are rapidly transformed into ulcers, covered by thick crusts. Its course and situation are similar to the preceding class.

The *syphilide tuberculo-ulcérante gangréneuse*, also called *carbunculus veneris*, is a very destructive—and, fortunately, quite uncommon—syphilide.

It commences as dark-red, deeply seated tubercles, in the centre of which a black slough forms; it increases in size, and is thrown off, exposing a deep undermined ulcer with foul ichorous secretion. Each tubercle is surrounded by a zone of redness. If healing occur, a depressed, copper-colored cicatrix is left, which, in time, becomes white. The eruption is situated upon the face, the extremities, the shoulders, and the buttocks.

The invasion is rapid, but the course of the lesion is chronic.

Preceding the appearance of these syphilides, the patient has a rise of temperature, accompanied by general malaise, various neuralgic pains, loss of appetite, and an anæmic appearance.

CHAPTER V.

· SYPHILIS OF THE APPENDAGES OF THE SKIN.

THE HAIR.

ALOPECIA is a very common manifestation of syphilis ; it may be either slight or quite extensive, is rarely permanent, and runs a rapid course in some cases and a chronic one in others.

It is unaccompanied by heat or itching. There may be no marked lesions of the scalp, or the hair-follicles may be attacked by macules, papules, pustules, or ulcers.

The eyebrows, the beard and the moustache, the hair of the pubes and the axillæ may be involved ; the eyelashes are seldom attacked, unless by an ulcerative lesion.

There are two varieties of syphilitic alopecia ; first, thinning of the hair, and second, loss of the hair in spots or patches.

Alopecia generally occurs about the third month of the disease, but may appear at any time before the end of the second year.

Alopecia is the result of impaired nutrition of the hair-follicles, due to the syphilitic virus. Permanent baldness results from ulcerative processes attacking the hair-follicles.

The prognosis, as a rule, is good, provided the loss of hair has not been too extensive, and the patient has been properly treated.

THE NAILS.

Syphilitic lesions of the nails are of two varieties: first, *onychia*, in which the disease begins in the substance of the nail; and second, *perionychia*, in which the disease commences around the nail, and finally involves it.

The course of these lesions is chronic, and may be either mild or severe. They usually occur within the first two years of the disease, but may appear much later.

In *syphilitic onychia* the process may be dry (*onychia sicca*), and limited to the nail, or the nail may be separated from its bed.

In *onychia sicca* the nail loses its lustre and transparency, and becomes dull-yellow in color. The disease may be limited by a line of demarcation, or involve the entire nail. The edge of the nail is thick, brittle and cracks readily; its surface is rough and marked by shallow, longitudinal fissures and depressions; the surrounding epidermis is generally thick and scaly.

The diseased portion is gradually pushed forward, grows out, and is replaced by healthy nail tissue.

Separation of the nail may be partial or complete, and generally occurs in the early part of the secondary stage.

It begins at the free border of the nail, and gradually creeps toward its base, the diseased area becoming greenish-brown in color. If only a portion of the nail has been destroyed, the healthy part pushes forward and covers the denuded space; but if destruction has been complete, an entirely new nail is formed.

One or several nails may be affected; those of the fingers more frequently than the toes.

There is sometimes a *local necrosis* of the nails, which become white in spots about the size of a pin's head; these are finally depressed and extend to the matrix, leaving sharply cut holes in the nail.

There are two varieties of syphilitic perionychia: the non-ulcerative and the ulcerative forms.

The *non-ulcerative* form attacks a portion of, or the entire attached border of the nail, which becomes infiltrated and thickened; this condition may persist until the nail loses its lustre and is marked by transverse furrows. Ulceration sometimes occurs where the skin is reflected from the nail, and extending beneath it causes it to loosen and fall off.

The *ulcerative* form occurs during the secondary stage of the disease. It may begin as a papule, pustule, ulceration, or fissure at some part of the nail margin, and spread beneath it, secreting a foul pus. The whole nail may be destroyed, or only a portion of it, but if the process be checked a new nail forms and pushes the old one out in front of it.

If the ulceration is severe the entire matrix becomes involved; the nail is thrown off, leaving a yellowish surface, surrounded by an ulcerated and inflamed border. In such cases the entire phalanx is swollen.

Unless the ulcerative process has been too severe, a new nail is produced, which after a little time may become quite as good as the normal one.

All forms of perionychia usually last from one to two months, and in some cases a year.

CHAPTER VI.

SYPHILIS OF THE MUCOUS MEMBRANES.

ERYTHEMA.

Erythema of the mucous membranes occurs during the entire course of syphilis, particularly in the first months; it is similar to that of the skin, but is modified by the moisture and irritation to which mucous membranes are subjected. It most frequently involves the ^{*}fauces, pituitary membrane, and genital organs.

There may be a simple redness of the mucous membrane without swelling, or redness with œdema of the parts. In the more advanced cases the mucous membrane has a milky appearance, its epithelium becomes detached in spots, thus causing erosions of the surface, which in some cases is dry, while in others it is covered by an abundant secretion.

MUCOUS PATCHES.

Mucous patches, also called mucous papules, consist of flat or slightly convex rose-colored elevations, whose surface resembles mucous membrane.

They are situated about the genitals and anus, on the inside of the cheeks, particularly at the angles of the mouth, upon the lips, the tongue, the uvula and the tonsils, at the openings of the nares, upon the conjunctiva, the umbilicus, and the os uteri. In men they are most frequently situated around the anus and in the mouth, but in women upon the vulva.

They are one of the earliest and most frequent secondary manifestations of syphilis. The lesion consists of a hyperplasia of the papillæ, and a proliferation of cells in the mucous layer; the epithelium on the surface of the patch may remain intact or become detached, the surface being depressed by ulceration or raised by further development of the papillæ.

Uncleanliness, heat, and moisture favor their development. A mucous patch may originate from the surface of a chancre, thus transforming a primary into a secondary manifestation.

Mucous patches readily ulcerate when exposed to friction from the clothing or opposed surfaces of integument, and unlike the other syphilitic eruptions they are frequently attended by pruritus.

Mucous patches within the mouth are of a grayish-white color, looking as if the mucous membrane had been touched with nitrate of silver or pure carbolic acid. They are irregular in outline, and, as a rule, not elevated; when situated upon the tonsils, they usually ulcerate, owing to the constant friction to which these organs are subjected.

Their course is exceedingly chronic and they are very apt to recur.

Condylomata are nothing more than mucous patches, which from their situation upon the integument around the anus and genital organs are altered in appearance. They consist of round discs, either single or multiple, of a reddish or grayish color, with granular surface, and elevated above the surrounding skin. They begin as small red spots, whose epidermis being removed by friction, leaves a moist grayish surface, which is finally converted into an elevated wart-like disc, with offensive secretion.

CHAPTER VII.

SYPHILIS OF THE DIGESTIVE ORGANS.

THE MOUTH.

Erythema is usually limited to the neighborhood of the fauces, and associated with œdema, especially of the uvula and velum.

Mucous patches are most frequently situated upon the tonsils, the uvula, the velum palati and its pillars, the sides of the tongue, the inner surfaces of the lips and cheeks, and at the angles of the mouth. Less frequently they are observed upon the gums and the dorsum of the tongue.

Papules and Vesicles.—Papules often occur in the mouth during a general papular eruption, but vesicles are very rare in this situation, owing to the constant moisture and friction.

Near the angles of the mouth, especially in habitual smokers, are frequently seen patches called *plaques des fumeurs*; they consist of an accumulation of epithelial cells, which become whitish in color, and in some instances fissured or eroded.

THE TONGUE.

Secondary lesions of the tongue cause but little pain or inconvenience, unless irritated by alcoholics or smoking. They yield readily to treatment, leave no traces of their existence, but are very liable to recur, especially

in smokers. They have a tendency to become circular in form.

"*Psoriasis of the tongue*" has been described, but its syphilitic origin is still very doubtful. It occurs upon the dorsum of the organ as silvery-white patches of leathery consistence, and accompanied by epithelial exfoliation.

"*Ichthyosis*" is a similar affection of the tongue, but occurs very rarely during the course of syphilis. By some it is considered identical with psoriasis of the tongue.

Mucous patches may be situated upon the sides or dorsum of the tongue; when occurring in the latter position, their bases may become indurated and fissured, and the pellicle which covers them rubbed off, thus leaving a somewhat depressed surface; or they may granulate above the level of the surrounding parts.

Sclerosis of the tongue usually develops about the fifth year of the disease. It occurs upon the dorsum, near the median line, and is either superficial or deep in character.

Superficial sclerosis involves only the mucous membrane, and produces a "parchment" induration. It is either circumscribed or diffuse, and ulcerates only when injured by the teeth or irritated by alcohol and tobacco.

Deep or *parenchymatous* sclerosis attacks the mucous and muscular tissues. The tongue may be greatly increased in size, but after a time the newly formed fibrous tissue retracts, and the organ becomes atrophied. The edges of the tongue receive the markings of the teeth, while the body is lobulated. The lobules are separated by furrows which cannot be effaced. Ulceration may ensue from irritation or injury.

Gummata are later lesions, and may be either superficial or parenchymatous. *Superficial* or *mucous* gummata commence as small nodules, which soon soften and ulcerate. The ulcer has perpendicular walls, infiltrated base, and its floor is covered by a yellowish-white film. *Parenchymatous* gummata begin as small nodules in the muscular tissue of the tongue; they undergo degeneration, and finally the mucous membrane covering them ruptures, leaving a deep cavity, with sloughing undermined walls, and surrounded by an indurated areola.

The differential diagnosis between syphilitic ulcers or tumors of the tongue and those of non-specific origin is very important and oftentimes difficult.

The *initial lesion* is usually situated at or near the tip of the tongue, is single, surrounded by induration, and the lymphatic glands in anatomical connection are enlarged.

Gummatous tumors are insidious in their origin, chronic in their course, and generally free from pain. They are situated upon the dorsum and posterior half of the tongue near the median line. The lymphatic glands are rarely affected and the functions of the tongue are not interfered with.

Gummatous ulcers are usually multiple and situated upon the dorsum. The floor is sloughy and slightly vascular, and the edges are undermined. Ganglionic enlargement is rare. They cause some pain.

The above lesions are all benefited by anti-syphilitic treatment, and the previous history aids greatly in making a correct diagnosis.

Tubercular ulcers of the tongue are painful; they are situated at, or near its tip, or any part of the dorsal surface; they are generally single, but may be multiple.

The lymphatic glands may or may not be affected. The ulcer has bevelled edges, flabby granulations, and is not surrounded by induration. The microscope shows the tubercle bacilli.

Carcinoma. The ulcer is single, very painful, and situated on the borders and anterior half of the tongue; its edges are raised and hard, and the surrounding tissues are thickened. The floor is very vascular, bleeds readily, and secretes an ichorous pus. The functions of the tongue are interfered with. The lymphatic glands are always enlarged. The microscope shows cancer cells.

NECROSIS OF THE MAXILLARY BONES.

This manifestation of the disease is most frequently seen in the hard palate, and the alveolar process of the superior maxillary bones.

When the hard palate is affected, an abscess forms on the roof of the mouth near the median line; it finally ruptures, and reveals exposed bone. After separation of the sequestrum an opening is left between the nose and the mouth, which interferes greatly with articulation and deglutition. This condition may be remedied by wearing a plate, or by a plastic operation. The patient should be put upon the "mixed treatment," which causes marked benefit in these cases.

Necrosis of the alveolar process occurs in the upper jaw near the central incisors, and as the disease extends the teeth loosen and fall out.

GUMMY TUMOR OF THE SOFT PALATE.

In this affection premonitory symptoms are insignificant or entirely absent. Suddenly the voice becomes

transformed into a nasal whisper, and attempts at swallowing liquids or solids are followed by their regurgitation through the nose.

The lesion commences in either of two ways: *first*, a circumscribed deposit of gummy material takes place between the buccal and nasal surfaces of the soft palate; *second*, there is a diffuse infiltration of the entire velum, its mucous membrane becomes reddened, and its mobility impaired. Rupture of the abscess or ulceration of the infiltrated tissue may involve one or both mucous surfaces, thus causing partial or complete perforation of the soft palate with its concomitant symptoms, such as regurgitation of the food and nasal articulation. As the process of repair commences, the opening gradually contracts until it is greatly diminished in size or completely occluded.

THE PHARYNX.

Erythema, superficial ulcers, and deep ulcerations resulting from the degeneration of gummatous tumors may be observed; mucous patches are extremely rare in this region.

The posterior portion of the lateral walls is most frequently attacked. Gummy tumors have been seen upon the vault of the pharynx and on the upper part of its posterior wall. The lesions encountered in this region are similar to those observed in the mouth.

THE ŒSOPHAGUS.

Syphilitic ulceration of the mucous membrane of the walls of the Œsophagus sometimes occurs, and as the ulcers heal, their cicatrices contract, thus forming stric-

ture of the tube, which, becoming narrowed, interferes with deglutition, and therefore with the proper nourishment of the patient, who becomes emaciated and feeble. True syphilitic gummata have also been found in the œsophageal walls.

These patients should be put upon the "mixed treatment," and at the same time have the stricture dilated with œsophageal bougies.

THE STOMACH AND INTESTINES.

Accompanying the appearance of the early secondary manifestations is frequently seen a functional disturbance of the digestive organs, such as loss of appetite, nausea, and vomiting. The existence of syphilitic erythema of the stomach and intestines has not been demonstrated, but ulcerations of the mucous membrane of these viscera, probably due to degeneration of gummy deposits, have been observed.

The symptoms consist of constant and obstinate diarrhœa, sometimes with bloody stools attended by a feeling of abdominal oppression, and occasionally with severe colic. The appetite diminishes and the food may be vomited a few hours after its ingestion. The patient loses in strength and weight, and assumes a condition of general cachexia, which is always observed in syphilitic affections of the intestinal organs.

These lesions, if recognized, are best treated with mercury and iodide of potash in combination.

THE RECTUM.

Tertiary lesions of the rectum and anus are quite rare, and are divided into *ulcerating syphilides*, *gumous*

syphilides, and *syphilôme ano-rectal*. The *ulcerating syphilides* are divided into two forms: *first*, those which are continuous with ulcers outside the anus and extend within the sphincter; *second*, those which are developed within the rectum or sigmoid flexure.

These lesions are uncommon, as is also the case with gummous infiltration.

In *syphilôme ano-rectal* we have a frequent cause of stricture of the rectum. The entire circumference of the rectal wall is transformed into a thickened, hard cylinder, but with no trace of ulceration. If the infiltration be limited to the vicinity of the anus, it is circumscribed, forming tense, tumor-like masses, which are liable to erosion and ulceration.

These lesions are curable if diagnosed and properly handled at an early date, but if neglected they invariably result in stricture.

The treatment consists of the internal administration of mercury and iodide of potash, with dilatation, or if necessary, division of the stricture. Local applications of mercurial ointment smeared on bougies is also an excellent method.

THE LIVER.

The liver is invaded by syphilis more frequently than any other abdominal organ. Congestion of the liver sometimes occurs in the *secondary* stage of the disease, and is usually associated with a cutaneous eruption; it generally lasts for from one to two weeks.

The symptoms are icterus, gastric disturbances, and febrile reaction; the organ being sensitive on pressure. This condition is probably due to the extension of a

specific catarrh of the intestine to the liver, by way of the ductus communis choledochus.

The *tertiary* forms of syphilitic affections of the liver are chronic interstitial hepatitis, gummata, and amyloid degeneration.

Chronic interstitial hepatitis may be *general* or *partial*. The former condition is rare and cannot be distinguished from cirrhosis.

In the *partial* form the increase of fibrous tissue is especially marked in the capsule of Glisson. The contraction of this newly formed tissue causes lobulation of the organ, which is at first increased, but later diminished in size. The symptoms are the same as those of ordinary cirrhosis.

Gummata are found imbedded in the fibrous tissue and are usually small, multiple, and frequently grouped. They have an irregular outline and firm consistence.

The symptoms are often obscure; the organ may be increased in size and the nodules felt upon its surface. Pain may be present or absent. The functions of the organ are not interfered with, unless the tumors are numerous. In severe cases there are icterus, gastrointestinal disturbances, and clay-colored stools.

Gummy tumors must be differentiated from cancer and hydatid cysts.

Amyloid degeneration. In this affection the morbid process involves the hepatic cells, which become enlarged and irregular in outline, the nuclei of some disappearing. The liver is heavier, greatly enlarged, and firmer in consistence, but not lobulated.

The symptoms resemble those of cirrhosis. The "mixed treatment" should be employed in these cases.

THE SPLEEN.

In rare cases enlargement of the spleen occurs early in the course of syphilis. The swelling is quite rapid, usually painless, but may give rise to a feeling of weight. It generally subsides in three or four weeks, but may remain several months, and is liable to occur at any time during the secondary period.

Gummata of the spleen are either single or multiple, and vary in size from that of a millet-seed to a walnut; they may be deeply seated or upon the periphery of the organ.

THE PANCREAS.

Specific affections of the pancreas are very rare, but it cannot be denied that like the other viscera it is subject to the diffuse and circumscribed lesions of syphilis.

CHAPTER VIII.

SYPHILIS OF THE RESPIRATORY ORGANS.

THE NOSE.

THE mucous membrane lining the nose may be the seat of *erythema*, *ulcerations*, and *mucous patches*. The symptoms of these lesions resemble those of ordinary catarrh.

In the later stages of syphilis, deeper ulcerations occur, which originate in gummous infiltration of the submucous tissue, and may finally involve the adjacent cartilages and bones, thus leading to serious deformity of the organ from destruction of its framework.

THE LARYNX.

Laryngeal lesions are very variable as regards their time of appearance and the severity of their symptoms. The invasion is usually insidious, and the course chronic and painless.

The *secondary* or superficial lesions consist of erythema, superficial ulcerations, mucous patches, chronic inflammation, and vegetations.

The *tertiary* or deep lesions comprise deep ulcerations, gummata, inflammation, and necrosis of the cartilages.

Erythema of the larynx causes some huskiness of the voice and slight catarrh. It occurs during the course of the early skin eruptions, and is either diffuse or circumscribed; superficial erosions do sometimes occur.

Superficial ulcerations involve only the mucous membrane. Their margins are sharply defined, regular, and slightly elevated, and the floor is covered by a tenacious secretion.

They may interfere with phonation to a more or less marked degree.

Mucous patches generally occur from one and a half to twelve months after infection, and may be situated upon any portion of the mucous membrane. If exposed to irritation during respiration or phonation they become prominent, with ragged margins.

Chronic inflammation may appear early, or not until the third or fourth year of the disease. It is a very persistent affection, and usually leads to a thickening of the mucous membrane. Chronic ulcers are always associated with this condition.

Vegetations may spring from the margin of an ulcer or from the mucous membrane itself.

In the *later stages* of syphilis, *deep ulcerations* occur and generally begin in degenerated gummata. Extensive regions may be destroyed in this manner. Very frequently vegetations arise from the ulcers.

Gummy tumors of the larynx are quite common; they are either single and large, or multiple and small.

The deposit sometimes undergoes absorption, but most frequently degenerates, forming deep, ragged ulcers, which may attack the framework of the larynx and produce permanent deformity.

These lesions are liable to cause an impediment to respiration, either from their size or from causing acute oedema of the larynx.

Perichondritis is usually caused by an extension outward of an inflammatory or ulcerative process from the

mucous or submucous tissue. The cartilages themselves may be invaded by the process and partially or totally destroyed.

Necrosis occurs in cases where the cartilages are ossified and is a very late manifestation. It follows perichondritis quite frequently.

THE TRACHEA.

Syphilitic lesions of the trachea are rare, but may be similar to those which attack the larynx.

Ulcerative processes are the most common, and sometimes result in stricture from the contraction of their cicatrices.

The principal symptoms of tracheal syphilis are cough, purulent expectoration, and dyspnœa. If stenosis of the tube occur, its most common seat is just above the bifurcation.

THE BRONCHI.

Specific ulceration may attack the bronchi and give rise to subsequent stricture.

THE LUNGS.

The pulmonary lesions due to syphilis are interstitial pneumonia and gummy tumors.

Interstitial pneumonia usually affects a small extent of tissue, and rarely involves an entire lobe; it may be disseminated at various points. The diseased portion of lung becomes hard, firm, elastic, and non-crepitant.

Gummy tumors may be single or multiple, and resemble those situated in other organs. As a general rule they are superficial and placed in the lower lobes.

They undergo degeneration from the centre outward, leaving cavities with white fibrous walls.

In some cases syphilitic lesions of the lungs cause no symptoms, in others there is a slight disturbance of respiration, and in others there is cough, pain, expectoration, and all the symptoms of phthisis except the temperature, which rarely goes above 101° F. The majority of these cases yield readily to specific treatment.

CHAPTER IX.

SYPHILIS OF THE ORGANS OF CIRCULATION.

THE HEART.

SYPHILIS attacks the heart in two ways: first, as a diffuse or interstitial myocarditis; and, second, as gummy tumors.

Gummy tumors of the heart vary greatly in size and number, and are most commonly found in the wall of the left ventricle, but may occur in any portion of the muscular tissue. They generally appear late in the course of the disease, and resemble gummata situated in other organs.

As a rule, they do not degenerate or rupture, but become caseous, and slowly contract. The endocardium covering them is commonly inflamed and thickened, and in some cases vegetations spring from its surface. The pericardium is also liable to become inflamed.

The symptoms of cardiac syphilis may be absent in some cases and very obscure in others. The action of the heart becomes irregular and feeble, and the patient suffers from palpitation, dyspnœa, cyanosis, and pain over the region of the organ.

The treatment consists in the use of iodide of potash combined with tonics and stimulants.

THE BLOODVESSELS.

Syphilitic affections of the veins and capillaries are very rare. The arteries may be attacked primarily, or

secondarily to specific disease of the surrounding tissues. Primary lesions generally occur in the small arteries of the brain.

The symptoms depend upon the situation of the lesion. If the cerebral arteries are attacked, there is severe headache, paralysis with or without coma, aphasia and muscular spasms. In fatal cases these are followed by delirium and epileptiform convulsions, with fever.

If the carotid artery be affected, there is cerebral impairment, pain in the head, and epileptiform seizures.

In *affections of the arteries* the calibre of the vessel is reduced, and sometimes occluded, by a new, dense, cellular formation in the internal coat, which resembles granulation tissue, and finally becoming organized, this new formation involves the entire circumference of the vessel, and extends outward as well as inward, invading both the middle and external coats. It occurs in patches, which are generally single; a thrombus may form on the patch, become organized, and thus obstruct the lumen of the vessel.

In some instances the changes in the artery are very slight, the process being limited to the internal coat; in others, the vessel is thickened, rigid and nodulated in appearance.

The disease most frequently affects the carotid and its branches, especially the middle cerebral.

The lesion may occur as early as the first year, or as late as the twentieth, but as a rule appears about the third year after infection.

CHAPTER X.

SYPHILIS OF THE GENITO-URINARY ORGANS.

EPIDIDYMITIS.

THIS may occur as early as the second month or as late as the fifth year, but generally develops within the first six months of the disease. It is more commonly unilateral, and as a rule it attacks the globus major. Its invasion is usually unattended by any symptoms, except occasionally, when there is a slight sense of uneasiness in the part.

The lesion consists of a smooth, firm, round, or oval tumor, situated just above the testicle, which is about the size of a pea, or in some instances larger. It shows no degenerative tendency, and quickly disappears under anti-syphilitic treatment. The scrotum remains unaffected.

ORCHITIS.

Syphilitic orchitis may occur as early as the fourth or fifth month, but in the majority of cases it is a tertiary symptom, and appears several years after infection.

In most cases both testicles are involved, either at the same time or consecutively. The body of the organ is increased in size, and painless, and there is a hydrocele of the tunica vaginalis.

At the beginning of the disease there may be little projections upon the surface of the testicle, due to

syphilitic deposits, which, as the process progresses, fuse together, forming a hard tumor, resembling almost exactly the shape of the normal testicle.

In other cases the surface of the tumor is perfectly smooth.

The course of this affection is very slow. If untreated, it may result in partial or complete atrophy of the organ, or the parenchyma of the gland may degenerate into fibrous, cartilaginous, or even osseous tissue. As a general rule, suppuration does not occur.

It yields readily to treatment if recognized at an early period.

The lesion may be diffuse or circumscribed.

In the *diffuse* form the whole organ is increased in size, firm, hard and resistant, and unless treated results in atrophy. There is also a certain amount of hydrocele.

In the *circumscribed* form, gummy material is deposited in masses through the testicle. These masses have a tendency to undergo secondary degeneration and softening, thus causing inflammation and ulceration of the surrounding tissues, and, finally, leading to syphilitic fungus of the testicle.

The vas deferens usually remains normal in syphilitic orchitis, although it may be involved; this is true also of the vesiculæ seminales and prostate gland.

THE PENIS.

Deposits of syphilitic material may occur in the penis, especially near the sulcus behind the glans, and are also to be found in the corpora cavernosa.

These deposits gradually increase in size without

giving rise to any pain, but soon cause deformity of the organ, especially during erection.

THE OVARIES, ETC.

The ovaries. Syphilitic affections of the ovaries resemble those of the testes, but are rarely encountered. The symptoms are slight pain and increase in the size of the organs, with loss of the sexual appetite, and sterility.

The *Fallopian tubes* are not involved. Cases are reported in which *uterine* tumors in syphilitic subjects have disappeared under anti-syphilitic treatment, thus showing that this organ may also be the seat of late syphilitic manifestations.

Exulcerative hypertrophy of the neck of the uterus consists of an enlargement and hardening of the os, which becomes congested and ulcerated; the secretion from the ulcer being *contagious*, scanty and muco-purulent in character. This lesion begins about the eighth week after infection, runs a chronic course, but responds readily to internal mercurial, and local treatment.

THE KIDNEYS.

In the kidneys of syphilitic subjects the same lesions are met with as occur in the other organs, such as interstitial nephritis, gummy tumors and cicatrices, which latter result from the preceding affections.

CHAPTER XI.

SYPHILIS OF THE NERVOUS SYSTEM.

SYPHILITIC affections of the nervous system are very numerous and of frequent occurrence; they may appear as early as the sixth month, or as late as the twentieth year after infection, and are more frequent in men than in women. Nervous phenomena are more apt to occur in neurotic subjects and those addicted to alcoholic excesses.

Affections of the dura mater. The dura mater is very susceptible to syphilitic invasion. The changes produced in it are increase in thickness, roughening of its inner surface, and increased vascularity. It may be affected alone, or the disease may extend to the inner surface of the skull and the arachnoid, or the dura mater may be secondarily involved by processes beginning in the pia mater and arachnoid.

The syphiloma may be diffuse or circumscribed. Syphilomata of the spinal dura mater resemble those of the cerebral in origin and course.

Affections of the arachnoid and pia mater consist of congestion and enlargement of the vessels, with increase of connective tissue and thickening. Sometimes gummatus infiltration occurs, giving rise to a gummous meningitis.

The lesion may invade the dura mater and the bones of the skull, and is probably the most frequent syphilitic lesion. It occurs in patches, which are sharply circumscribed, and either single or multiple.

Affections of the brain and cord are always secondary to lesions of the bones, meninges or vessels, and consist of red and white softening.

Affections of the nerves. The cerebro-spinal nerves may be invaded by the lesions of the meninges, or they may be surrounded by gummata, or compressed as they pass through bony canals.

The third pair are most often affected.

There may be a neuritis and perineuritis.

The peripheral nerves are affected in a similar manner.

The sympathetic nerves may be invaded in either one or two ways: first, by pigmentary or colloid degeneration of the nerve-cells, and second, by sclerosis of the connective tissue, causing atrophy of the nervous elements.

CEREBRAL SYPHILIS.

Cerebral syphilis comes on slowly, and is usually preceded by headache, either general or limited to the frontal or occipital regions; it may be mild, or very severe in character, continuing day and night, and remains from one week to two months, but is readily influenced by the use of mercury. It is frequently accompanied by neuralgia of one or more of the cranial nerves.

In the early secondary stage there is sometimes a form of headache which exists during the day, or may be absent and come on toward evening or at night, and is generally limited to a single region. This form always indicates extensive structural changes, and its course is very chronic. It may be intermittent, or cease for days and weeks, then return, and last for weeks and months.

Sleeplessness is sometimes a prodromal symptom of cerebral syphilis, and may be very persistent and troublesome to combat.

Vertigo is also a well-marked prodromal symptom; it varies in intensity, and accompanies the headache, which is present during the day.

There may be impairment of the memory, with hesitating speech; these subjects become melancholy and petulant, and complain of numbness in the head, hyperæsthesia or anæsthesia, with weakness of the extremities.

In some cases there is photophobia, accompanied by dull, frontal headache. There may be ataxic symptoms, with paralysis of one of the cranial nerves, especially those going to the muscles of the eye.

Nocturnal delirium, either mild or very severe in character, may be a prominent symptom; this leaves the patient depressed, and with a dull, heavy feeling in the head.

SYPHILITIC TUMORS OF THE NERVOUS SYSTEM.

Two forms of syphilitic tumors occur in the cranio-vertebral cavity; they are usually connected with the cerebrum, but rarely found in the medulla, cord, or cerebellum.

The *first* form is grayish-red in color, highly vascular, and either firm or soft in consistence. It consists of small, round cells in a stroma of connective tissue.

The *second* form, which is really a degenerating stage of the first, is yellow in color and hard.

These tumors may be single or multiple, and vary in size from that of a pea to a walnut.

They occur chiefly on the under surface of the brain,

near the Sylvian fissure, and as a rule are peripheral, but if found in the brain tissue it will be observed that they have grown in from the vascular membrane.

HEMIPLEGIA.

Specific hemiplegia is a very frequent symptom of cerebral syphilis.

It may occur as early as the sixth month or as late as the twentieth year after infection, and is usually preceded by localized headache, vertigo, and convulsions. Sometimes there are muscular spasms, pains, or numbness in the parts which afterward become paralyzed.

The invasion is either gradual or sudden, and usually comes on when the patient is engaged in some muscular effort or is in bed at night.

If the paralysis be partial it may gradually improve, or even disappear, or as improvement takes place the opposite side may be similarly affected.

In rare cases there is a loss of both motion and sensation; this may be accompanied by paralyses of various nerves, aphasia, mydriasis, optic neuritis, and epilepsy. Some patients suffer from mental depression, while others are very emotional.

EPILEPSY.

Syphilitic epilepsy occurs in two forms: first, the *grand mal*, and second, the *petit mal*.

It is a very frequent manifestation of cerebral syphilis, and is always preceded by severe headache.

The symptoms of the *severe* form consist of sudden loss of consciousness, tonic and clonic spasms, facial

distortion, foaming at the mouth, and stertorous respiration ; the aura and epileptic cry are not always present. These convulsions generally occur at short intervals and with well-marked regularity ; some patients regain consciousness in a few minutes, while others remain in a stupid condition for hours.

The *mild* form begins with twitching of the muscles of one side of the face, turning of the tongue to one side, a tendency of the subject to turn around, giddiness, general trembling or great weakness, or cramps in the extremities, loss of consciousness, and a convulsion. The seizure may be confined to a single limb or one side of the body. Very often there is no spasm ; the patient loses consciousness and stares vacantly into space ; this condition lasts a few moments or even several minutes.

PARAPLEGIA.

The spinal cord is not so frequently attacked by syphilis as is the brain.

The causes of syphilitic paraplegia are lesions of the vertebræ, of the spinal meninges, and gummata which press upon the cord.

The symptoms consist of a varying amount of pain in the back, weakness of the lower extremities, darting pains in the legs, numbness, tickling or aching pains in the feet, with hyperæsthesia or anæsthesia. Loss of coördination is sometimes observed. The expulsive force of the bladder and rectum is weakened.

A patient may remain in this condition for a long time, but unless properly treated complete paralysis of both lower extremities finally comes on. General sensation may remain or be somewhat impaired or lost.

Paraplegia is a later manifestation of syphilis than hemiplegia or epilepsy, and generally occurs after the sixth year of the disease, but may show itself much later.

APHASIA.

Disturbances of speech frequently occur during the course of syphilis of the nervous system.

There may be hesitation in speaking, or inability to remember certain words in conversation and writing, or the use of inappropriate words.

The affection is continuous or intermittent in character.

LOCOMOTOR ATAXIA.

Authorities differ as to whether syphilis may be the direct cause of this disease or not.

Locomotor ataxia is caused by a lesion which begins in, and is limited to, the posterior columns of the cord, whereas, *syphilitic lesions* of the cord originate in the bones or meninges and attack the cord secondarily.

Syphilis causes loss of coördination, staggering gait, darting pains, and muscular spasms, but these symptoms are irregular and uncertain as compared to those due to non-specific tabes, which are slow and irregular.

PSEUDO GENERAL PARALYSIS OF SYPHILITIC ORIGIN.

This affection is manifested by such symptoms as cerebral excitement, gayness of spirits alternating with depression, together with delirium or even mania. The motor disturbances consist of uncertain movements with-

out paralysis, trembling of the hands, hesitating speech and staggering gait, headache, dizziness, impairment of sight and hearing, with epileptiform convulsions.

These symptoms do not all occur at the same time or in a regular manner, but appear at odd intervals.

CHAPTER XII.

SYPHILIS OF THE MUSCLES.

THERE are two forms of syphilitic affections of the muscles: first, the diffuse form, and second, gummy tumors.

The *diffuse form* consists of the development of connective tissue in the interfibrillar spaces, which eventually hardens, resulting in atrophy and destruction of the muscle. Any muscle may be attacked, but the flexors of the upper extremity, and especially the biceps, are most frequently invaded.

The muscle gradually shortens without causing any pain; the patient first notices that he is unable to fully extend the limb, but no change is detected on palpation.

It generally occurs about the tenth month, but may appear earlier or later.

Its course is chronic, lasting for several months or years.

The treatment of this affection consists in the internal use of the iodide of potash and mercury, with local inunctions of mercurial ointment.

Gummy tumors. These tumors consist of circumscribed deposits of gummy material. They are usually found in the larger muscles, such as the trapezius, the gluteus maximus, the sterno-mastoid, the vastus externus, the pectoralis major, and the walls of the heart. Gummata of the tongue, palate, or pharynx may origin-

ate in the muscular tissue, and secondarily involve the mucous membrane.

Gummy tumors grow slowly and without inflammation; they vary in shape and size, cause no pain, but if large interfere with motion; occur late in the disease and are accompanied by other syphilitic manifestations. As a general rule they never suppurate, but may become indurated, and even be converted into cartilage or bone, thus accounting for the osseous masses which are sometimes found in the muscles of old syphilitics.

The treatment is the same as for the diffuse form.

THE SHEATHS OF THE TENDONS, THE TENDONS, AND THE APONEUROSES.

Dorsal hygroma are firm, elastic, fluctuating tumors, which occur on the backs of the hands; they are triangular in shape, with their bases toward the fingers.

The lesion consists in a diffuse deposit of syphilitic material, with hyperæmia of the sheath and serous effusion.

They cause trifling pain, unless very large, when the skin may become tense, inflamed, and painful; they grow rapidly, and appear in the early years of the disease.

The tendons of the ankle and foot may be similarly affected.

Gummy tumors are sometimes found in the tendons, especially the larger ones, near their points of insertion and thicker portions. They are non-painful, and may remain indolent for quite a time, then break down and form ulcers.

Tumors of the *aponeuroses* are more diffuse than those

of the tendons ; their course is similar, but they are not so liable to degenerate.

As a rule they attack the firm, dense fascia of the extremities, especially the fascia lata.

THE BURSÆ.

In the *secondary* stage of syphilis there may be a congestion of, and a serous effusion into, the bursæ.

In the *tertiary* stage the bursæ are quite frequently attacked, especially the pre-patellar bursa.

The lesion consists of a gummous infiltration with connective-tissue formation. It begins painlessly, as a firm, hard, or elastic movable tumor beneath the skin ; it may remain in this condition for a long time, or acute inflammatory symptoms may set in, causing ulceration of the overlying integument, in which case the course becomes very chronic.

The patient should have the "mixed treatment," with local inunctions of mercurial ointment.

CHAPTER XIII.

SYPHILIS OF THE FINGERS AND TOES.

BY *dactylitis syphilitica* is meant a gummy deposit in the subcutaneous connective tissue of the fingers or toes, and an infiltration and inflammation of their bones.

It belongs to the tertiary period of the disease and has two varieties.

In the first variety the subcutaneous connective tissue and fibrous structures of the joints are involved, but in the second variety the process begins in the bones and periosteum, attacking the joints secondarily.

The lesion comes on slowly, and the patient's attention is first attracted by the enlargement of the finger or toe, which increases in size and becomes harder. The toes are generally affected in their entire length, but when a finger is attacked, the lesion is usually limited to a single phalanx, although the whole member may be included.

The finger or toe becomes red in color, resistant and tense; the swelling is most marked on the dorsal aspect and ends abruptly at the metacarpo-phalangeal articulation; it comes on slowly, and may or may not be painful. Symptoms of joint implication appear within a few weeks; flexion is impaired by the swelling, and if such a condition be left untreated the joint becomes abnormally mobile; sometimes there is hydrarthrosis and crepitation between the articular surfaces. This process may be limited to one or several members, is a late manifestation of the disease, and runs a chronic course.

The *second* form is limited to the bone, and is due to a specific periostitis or osteo-myelitis. Its course is either rapid, slow, or intermittent. In the majority of cases the whole bone is involved, but the disease may be limited to the extremities of two opposing phalanges. The proximal phalanx is more commonly involved than the distal one, and the fingers are more frequently attacked than the toes.

The process may affect several phalanges or fingers. The metacarpal and metatarsal bones can be attacked at the same time, or separately, but the metacarpal bones of the thumb and index finger are most frequently involved.

The integument is but little affected, unless the swelling is considerable, when it becomes tense and thin; in some cases ulceration takes place, the inflammatory focus always being on the side of the finger. Necrosis of the bone may occur, but, as a rule, resolution of the osseous swelling is the result. In about a month bony crepitation may be detected, owing to erosion of the articular cartilages. Effusion into the joint sometimes occurs, but is not serious, as the fluid is usually absorbed. The mobility of the articulation may be impaired or rendered too free. The shaft of the bone is either shortened or slightly elongated, but ordinarily the deformity is not marked. The tendons and their sheaths are not implicated. Pain is very slight or entirely absent.

This affection usually appears between the fifth and fifteenth years of the disease.

The treatment consists in the internal use of mercury and iodide of potassium. Mercurial ointment combined with pressure is the best local application, unless there is great tension, which should be relieved by free incisions.

CHAPTER XIV.

SYPHILIS OF THE BONES, CARTILAGES, AND JOINTS.

PRECOCIOUS OSSEOUS AFFECTIONS.

OSSEOUS lesions may occur in the early months of the disease, but are usually late manifestations.

The bones of the cranium, the ribs, the sternum, the clavicle, and the tibiæ are most liable to be affected early. Of the skull, the frontal and parietal bones are the ones usually attacked.

The nodes or swellings vary in size from half an inch to an inch and a half in diameter, and may be half an inch in height; they are single or multiple, round, smooth, and hard. Similar lesions are liable to form on the inner surface of the cranium, and give rise to cerebral symptoms.

The clavicle is generally attacked at its sternal extremity, the articulation being involved in some instances.

The upper third of the sternum is more frequently affected than the lower; the lesion may attack its borders and costal cartilages, and in this way set up a localized pleurisy. In severe cases the ribs are also invaded. Nodes are usually situated upon the subcutaneous surface of the tibia. The radius and ulna may be attacked, generally near the joints, the wrist more frequently than the elbow.

These tumors grow very rapidly, and are always accompanied by pain, which is worse at night.

The lesion is due to hyperæmia of the periosteum and new fibrous-tissue formation.

The nodes rarely break down into ulcers, but tend rather to spontaneous involution. They yield readily to treatment; or, if left alone, are converted into bony masses.

These lesions are generally accompanied by others of the secondary stage, and may occur even before the disappearance of the initial lesion.

These patients should have the "mixed treatment," combined with local inunctions of mercurial ointment.

LATE OSSEOUS LESIONS.

These lesions do not necessarily occur in every case of syphilis. They may appear with the late secondary lesions or when every trace of the disease has disappeared.

Osteo-periostitis. In this affection the lesion consists of an increased vascularity of the periosteum and the underlying bone, with an effusion and infiltration of either a fluid or gelatinous substance.

Any of the bones may be affected, but especially the tibia, the ulna, the clavicle, the sternum, and the cranial bones.

The process causes soft tumors of variable size, gradually shading into the surrounding tissues; attached to the bone, but not to the skin; sensitive on pressure, and painful, especially at night. Such tumors are called *nodes*.

Under appropriate treatment the nodes undergo resolution; otherwise the skin becomes red, thin, and adherent to the tumor, which breaks down into an ulcer; this results in superficial necrosis with an adherent cicatrix.

In other cases the effusion is transformed into bony tissue, constituting an exostosis, which being movable upon the bone beneath is called an *epiphysary exostosis*; this form is due to periostitis, and such exostoses are generally small and thin. Resolution is no longer possible; the tumor remains, and is not influenced by treatment.

In another set of cases syphilitic exostosis is the result of ostitis, which results in hypertrophy of the normal bone; this form is called *parenchymatous exostosis*, and the new formation is made up of either compact or cancellated tissue.

Exostoses may be situated on the inner surfaces of the cranial bones and give rise to very serious cerebral symptoms. The frontal bone is most frequently affected in this manner. In rare instances exostoses are found in the vertebra, sometimes external and sometimes within the spinal canal.

Osteo-myelitis. The deposit of syphilitic material generally takes place in the medullary canal of the long bones, but may occur in the periosteum or even in the substance of the bone itself.

The bones of the head are also liable to be affected, the syphilitic deposit occupying the diploë, thus separating the internal and external plates of the skull, and leading to caries or necrosis of them, and frequently to perforation, either internally or externally.

These lesions are generally confined to the bones of the head, the nose, the hard palate, and the alveolar process of the upper jaw, but the long bones may also be similarly affected.

Dry caries. By dry caries or "inflammatory atrophy

of the bones" is described an affection characterized by the entire absence of suppuration.

Most of the observations have been made upon the cranial bones, especially the frontal and parietal. The changes consist in atrophy at certain points upon the external or internal surface of the bone, with hypertrophy of the osseous tissue surrounding them; in this manner depressions are formed, which when existing upon both surfaces of the bone are liable to produce perforation.

Treatment. Osseous affections are best treated by potassium iodide, either alone or combined with mercury or mercurial inunctions. In many cases the iodide must be given in large doses to produce the required effect.

THE CARTILAGES.

Any of the cartilages are liable to be attacked during the course of syphilis; those of the larynx being most frequently invaded, especially in the later stages of the disease.

The lesion consists of a gummy infiltration, which is frequently followed by necrosis.

THE JOINTS.

The joints may be invaded during the secondary or the tertiary stages.

Arthralgia. Pain in the joints is frequently an early manifestation.

The lesion is a specific inflammation of the synovial membranes and fibrous tissues. The skin remains normal in all respects, and there is no effusion into the

joint; the only symptom being pain, with sometimes slight stiffness of the articulation. The pain, which varies greatly, generally becomes worse at night.

Any of the joints may be attacked, but generally the larger ones, usually the knee.

In some cases the cartilages are invaded, giving rise to crepitation.

The duration of this affection is very uncertain, but is readily influenced by mercurial treatment, or if it occur at a later stage, by a combination of mercury and potassium iodide.

Synovitis. There are two varieties of syphilitic synovitis; the first is a chronic effusion into the joint, without change in its structures; the second consists of effusion with thickening of the synovial membrane.

The *first variety* occurs in the early stage. The affection begins slowly and painlessly, and consists of an effusion and some stiffness of the articulation. The integument is not involved. The effusion may be slight or copious, and is intermittent in character; in some cases it is absorbed gradually, while in others it becomes chronic and very persistent. Suppuration or destruction of the joint does not occur.

During this process firm pressure may elicit some pain, otherwise there is none.

The *second variety* occurs late in the secondary and during the tertiary stage. The affected joint becomes slightly painful, enlarged, and its motion impaired. The effusion takes place slowly and is accompanied by thickening of the synovial membrane and fibrous tissue.

The lesion is due to gummy infiltration into the synovial membrane. In some cases the cartilages be-

come more or less eroded, thus giving rise to crepitation. There is but little tendency to complete ankylosis.

The knee-joint is the one most frequently affected.

The prognosis is good if the patient has suitable treatment at an early period. The "mixed treatment," combined with local inunctions of mercurial ointment proves very satisfactory. It is sometimes best to immobilize the joint in plaster-of-Paris, glass, or starch bandages.

CHAPTER XV.

SYPHILIS OF THE EYES.

THE ORBITAL BONES.

THE bones of the orbits may be attacked by either periostitis, caries, or necrosis, and present the same general symptoms as do similar lesions in the other bones.

The inflammatory process may extend from the diseased bones to the contents of the orbit, causing a cellulitis, which if untreated is liable to result in abscess and partial or complete destruction of the organ.

These lesions usually attack the orbital plate of the frontal and lachrymal bones.

Syphilitic nodes can form upon any of the four walls of the orbit, and if deeply situated cause protrusion of the eye, with more or less interference of vision.

THE LACHRYMAL PASSAGES.

Affections of the lachrymal passages may occur at any period of the disease.

In some cases they are limited to the mucous membrane and submucous tissue, and consist of catarrhal inflammation with oedema and ulceration. In the majority of cases the process begins in the bones or periosteum and involves the mucous membrane secondarily.

Symptoms. As the lachrymal passages become impervious, the tears collect upon the conjunctiva and flow

over the face; purulent matter forms in the lachrymal sac and regurgitates into the eye, causing conjunctivitis and inflammation of the puncta lachrymalis. If the process be very severe an abscess may form in the lachrymal sac.

THE LACHRYMAL GLAND.

Very few cases of affections of this gland have been reported.

The gland becomes swollen, pushing the upper lid forward, which in turn may become red and inflamed, but gives rise to no pain.

The trouble subsides rapidly under anti-syphilitic treatment.

THE EYELIDS.

Affections of the eyelids are not at all common; they are divided into eruptions, ulcerations, and infiltrations.

Eruptions may occur upon either the external or the internal surface of the lid, in the form of papules or pustules.

Ulcerations. The initial lesion may be situated upon any part of either surface of the lid, but most frequently occurs at its free margin.

Beginning as a papule or superficial ulcer, it is soon surrounded by well-marked induration with enlargement of the pre-auricular glands.

In the secondary period lesions of the lids occur as small, elevated, circumscribed spots of a grayish-red, yellow, or copper color.

Mucous patches are sometimes found upon the palpebral conjunctiva and resemble those situated elsewhere.

Ulcerations of the eyelid during this period generally

commence as gummy tumors or submucous infiltrations. They cause great destruction of the tissues and are generally situated upon the border of the lid.

The *infiltrations* between the cartilages and the integument do not always ulcerate, but may remain for a long time as nodules, which disappear under proper treatment.

The tarsal cartilages may become inflamed and thickened, causing œdema of the lid, with or without redness of the integument.

The affection is very chronic and results in the loss of elasticity of the cartilage.

The tendons and fasciæ of the muscles of the eye may also be involved in the general specific inflammation, which is apt to lead to abscess formation, and consequent destruction of the organ.

THE CONJUNCTIVA.

The ocular conjunctiva is rarely affected by syphilitic lesions, but may be the seat of tubercles, gummy tumors, and gummatous infiltration. Cases of papules and blotches have been observed coincidently with a general eruption; the initial lesion is sometimes situated here.

Secondary ulcerations may occur near the margin of the cornea; and begin as red, elevated spots, which soon ulcerate and are liable to extend to the cornea.

THE CORNEA.

Syphilitic ulceration of the cornea is a very rare manifestation. When inflammation does occur it is usually

in the substance of the cornea, and designated as *parenchymatous keratitis*, of which there are two forms: the diffuse and the punctate.

Diffuse keratitis is generally accompanied by a varying amount of pericorneal injection and slight grayish opacity of the cornea, which after a time gives it the appearance of ground-glass. As a rule there is not much pain or photophobia at first, but these symptoms gradually increase in intensity and are accompanied by lachrymation.

Diffuse keratitis is the form generally observed in young children and is almost always due to hereditary syphilis.

Punctate keratitis. The opacity occurs in sharply limited spots or points, which as a rule do not coalesce.

The lesion is gray or yellow in color and deeply seated.

Treatment. These patients should be put on mercurial treatment; protecting their eyes from the light by colored glasses, and keeping the pupil well dilated with a solution of sulphate of atropia, two grains to the ounce of distilled water; a drop or so of which should be dropped into the eye morning and evening.

THE SCLEROTIC.

Affections of the sclerotic coat are divided into episcleritis and parenchymatous scleritis.

Episcleritis generally begins as a hyperæmic spot near the margin of the cornea, which as the inflammation continues, becomes violet or purple in color. The conjunctiva is seldom involved, and then to a limited extent only. Any part of the cornea can be affected,

and several spots may form at the same time, and merge into each other.

There is usually but little pain, photophobia, or lachrymation with this process, which may in some cases invade the cornea, the iris, or the ciliary body.

Parenchymatous scleritis is a very rare affection. As a rule it commences by a zone of injection around the cornea, which is at first pink in color, but eventually becomes purplish. This pinkish zone gradually extends backward, covering entirely the anterior portion of the ball.

This affection may run a chronic, painless course, or cause photophobia, severe pain, and lachrymation.

The iris may or may not be implicated.

The sclerotic coat is sometimes the seat of gummous infiltration.

THE IRIS.

Syphilitic iritis is one of the most serious affections of the eye, and should be recognized early in order that proper treatment be employed.

It usually appears during the secondary period, but may occur much later.

There are three varieties of inflammation of the iris : first, simple or plastic iritis ; second, serous iritis ; and third, parenchymatous or suppurative iritis.

Simple or plastic iritis is characterized by congestion of the iris, with the production of an exudation from it, and in some cases by an increase of the connective tissue. As a rule there is injection of the conjunctival and sclerotic vessels. The color of the iris is changed, its surface is covered by a thin layer of fibrin, and on exposure to light it reacts slowly or not at all. The pupil may become irregular in shape, owing to the

adhesions between it and the capsule of the lens, or to the exudations into its substance.

Serous iritis. In this affection the exudation is serous in character, and is due to excessive secretion of turbid aqueous humor, which generally produces an increased intra-ocular tension; this causes deepening of the anterior chamber and dilatation of the pupil from pressure. Circumcorneal injection may be absent or present. Adhesions between the lens and the iris are very rare in this form.

Parenchymatous or suppurative iritis. In this form of iritis there is inflammation in the stroma of the iris, causing œdema of the membrane and increase in its cellular tissue elements. Elevations, also called tubercles or condylomata, occur upon the surface of the iris, and in composition are identical with gummy tumors. The vessels of the membrane are congested from retardation of their circulation. Adhesions between the margin of the pupil and the lens are very common. Pus is produced rapidly and abundantly in the anterior chamber.

Pain and photophobia may be very severe, or in some cases entirely wanting; vision is always more or less interfered with.

If the affection be early and properly treated the eye returns to its normal condition; but in cases that are neglected, permanent adhesions form which impede the motion of the iris.

THE CRYSTALLINE LENS.

The lens is never primarily affected by syphilitic inflammation, although secondary changes in the capsule and lenticular substance are common.

THE CILIARY BODY.

Primary cyclitis or inflammation of the ciliary body is very rare. It usually follows affections of the iris or the choroid.

The symptoms are intense pericorneal injection at one or more points, opposite any one of which there is retraction of the iris.

Gummata are also sometimes found in the ciliary body.

THE CHOROID.

There are three varieties of choroiditis: first, plastic choroiditis or choroiditis exudativa; second, serous choroiditis; and third, parenchymatous choroiditis.

Plastic choroiditis or *choroiditis exudativa* is characterized by the formation of an exudation upon the surface and in the substance of the choroid.

The exudation appears like yellowish-white or straw-colored spots, *over* which run the retinal vessels. These spots may be absorbed and leave no trace of their existence, but usually the exudation disappears, leaving atrophic changes in the choroid, which becomes greatly thinned and allows the sclera to be seen, thus giving a white, glistening appearance to the previously yellow spots.

Serous choroiditis is characterized by the exudation of a serous material from the choroidal membrane.

Parenchymatous choroiditis consists of a deep-seated inflammation with hypertrophy of the cellular tissue, forming little gummy tumors which project into the vitreous humor.

Syphilitic choroiditis usually develops in the late

secondary or the early tertiary period ; the treatment is the same as for iritis.

THE RETINA.

Retinitis or inflammation of the retina is marked by increased vascularity and opacity of the membrane, due to effusion into its substance.

It usually begins by a redness of the optic nerve entrance or by slight œdema, which obscures the underlying structures. The retinal vessels become enlarged, tortuous, and sometimes rupture, forming spots of ecchymosis. The deposits of lymph in the retina cause light-colored patches, *beneath* which pass the vessels of the *choroid* and the *retina*.

Retinitis is rather an uncommon manifestation, and generally occurs quite late in the disease.

The treatment is the same as for specific iritis.

THE OPTIC NERVE.

Optic neuritis, unless following an inflammation of the retina or choroid, is very rare, but does occur.

The ophthalmoscopic appearances of specific and non-specific neuritis are the same.

THE VITREOUS BODY.

Turbidity of the vitreous is a common complication of inflammation of the choroid. It is a disputed point, however, whether the vitreous is ever the seat of primary specific inflammation.

THE NERVES OF THE EYE.

Syphilitic paralysis of the nerves of the eye is a very common manifestation of the disease, and attacks most frequently the third pair, or motor oculi; next the sixth pair, or abducens, and finally the fourth pair, or patheticus.

Paralysis of the *third pair* causes ptosis, external strabismus, immobility of the ball, diplopia, and mydriasis.

Paralysis of the *sixth pair* gives rise to internal strabismus.

Paralysis of the *fourth pair* is followed by a loss of power of rotation of the eyeball on the affected side.

Sometimes only certain branches of a nerve are involved, or different nerves of both eyes may be affected simultaneously.

CHAPTER XVI.

SYPHILIS OF THE EAR.

THE *external ear* is sometimes the seat of the initial lesion. Papules occur in the post-auricular angle and upon the lobule, while the erythematous syphilide is generally seen upon those portions of integument which cover the cartilages.

Mucous patches are the most frequently observed syphilitic manifestations of the external auditory canal; they are either isolated or merged together, and completely occlude the canal, causing quite severe pain.

Ulcers are sometimes situated on the auricle and the walls of the external meatus; they are rounded in form, very painful and chronic, and begin as circumscribed inflammations or gummy tumors, which break down and suppurate.

There may also be hyperostosis, or exostosis of the bones.

The *middle ear* is that portion of the organ which is most frequently affected in syphilitic subjects, on account of its intimate connection with the nose and fauces, in which places syphilitic lesions are so common.

Mucous patches may be situated in the Eustachian tube or upon the walls of the middle ear; these either ulcerate or disappear under proper treatment.

The sequelæ of these affections are opacities, or destruction of the drum, loosening of the ossicles from their attachments, or caries of the temporal bone or ossicles.

The mastoid cells may also be involved as in ordinary suppurative otitis media.

Stricture or complete occlusion of the Eustachian tube may follow an acute and severe invasion of syphilis.

Hypertrophy of the lining membrane, membranous bands, polypi, or hyperplasia of the osseous tissues, cause impairment of hearing, according to their degree of development.

The *internal ear*. Very little is known of syphilitic lesions of this portion of the ear.

In cases of severe inflammation of the tympanum there may be congestion or even extravasation of blood into the internal ear. Atrophy of the auditory nerve may result from the long-continued interference with the passage of sound.

Cases of *sudden deafness*, due to syphilis, usually occur within the first four years of the disease, and as a rule both ears are affected simultaneously.

There is a feeling of fulness in the ear, but no pain; the patient has vertigo, and sometimes a staggering gait.

The attack is preceded by hyperæmia of the drums, which afterward become opaque, lustreless, and only slightly, if at all, injected; there is no sign of fluid in the middle ear. The Eustachian tube remains open, and the fauces may or may not be affected.

Deafness may also be due to syphilitic lesions of the brain which involve the auditory nerves.

Treatment. These patients should have the "mixed treatment" in large doses.

CHAPTER XVII.

PROGNOSIS OF SYPHILIS.

THE prognosis of syphilis depends largely upon the severity of the disease, which is liable to great variations in different individuals.

There are undoubtedly instances in which the disease tends to self-limitation, but one cannot prognosticate which case will do well and which one badly.

As a general rule, patients otherwise healthy experience very little trouble from syphilis, provided they have the proper treatment for a sufficient length of time and live moderate and regular lives. It is claimed that subjects with light complexion and reddish hair suffer more than those of dark complexion. The disease is very severe in old age. Alcoholic habits and intercurrent diseases render the prognosis less favorable.

The indications of a *mild* attack of syphilis are a long period of incubation ; a superficial initial lesion ; simple erythema without papules as the first syphilide ; gradual diminution in the size of the enlarged lymphatic glands ; infrequent outbreaks of general manifestations, separated by considerable intervals, and decreasing in severity.

A *severe* attack of syphilis is indicated by a short period of incubation and deep ulceration of the initial lesion ; by a pustular eruption on the scalp ; by ulceration of mucous patches ; by a papular, vesicular, pustular, or squamous eruption as the first syphilide ; persistency of glandular enlargements ; frequent and severe outbreaks of general manifestations.

CHAPTER XVIII.

TREATMENT OF THE SYPHILITIC LESIONS.

THE INITIAL LESION.

THOROUGH cauterization or complete excision of the initial lesion, even if performed in a few days or hours after its appearance, are of no avail in aborting syphilis.

The local treatment consists in scrupulous cleanliness of the lesion, and its protection from all sources of irritation. The sore should be washed in soap and water, and bichloride of mercury solution 1 : 2000, morning and evening, and covered with absorbent gauze wetted in the solution ; this dressing is changed every two hours.

If there be considerable induration about the lesion, mercurial ointment may be applied on gauze.

Iodoform, or calomel and bismuth in equal parts, are very good dusting-powders if suppurative action takes place ; black and yellow wash are also serviceable.

Should a film or membrane form upon the floor of the chancre, a *little* pure carbolic acid or nitric acid must be applied *very carefully*, cocaine having been previously used to allay the pain.

Mercurial treatment should not be commenced until the development of the secondary stage, unless the induration of the chancre be so great as to cause pain, or impair the function of the part, as when situated upon the mouth, the eye, or the meatus urinarius.

The initial lesion generally remains until secondary manifestations appear.

INDURATED LYMPHATIC GLANDS AND VESSELS.

If the ganglia are abnormally enlarged, inunctions of mercurial ointment should be made over them, and upon the parts supplied by their lymphatic vessels; these inunctions always produce a rapid diminution in the size of the glands.

THE SYPHILIDES.

The early syphilides require internal mercurial treatment, while those occurring later demand iodide of potassium combined with mercury.

If the early eruptions are very severe and persistent, it is best to stop internal medication, and use mercurial inunctions; when the eruption fades, the internal treatment can be resumed, and the inunctions stopped; the later eruptions should also be treated in the same manner.

By inunctions, we get the combined local and constitutional effect of the mercury.

Ulcers resulting from the pustular eruption, or any form of syphilitic ulceration, if very painful, should be touched with a strong solution of carbolic acid, and dressed with iodoform, calomel, or mercurial ointment; for exuberant granulations use the solid stick of nitrate of silver, or the scissors.

GUMMATA.

During the stage of infiltration, before ulceration has commenced, internal medication should be combined with local inunctions of mercurial ointment. After

ulceration has occurred, incision may be necessary, but it must not be practised too soon, as absorption sometimes takes place even at this late period.

GUMMATOUS ULCERS.

Gummatous ulcers should be thoroughly freed from all sloughs and débris, and then dressed with the usual antiseptics.

ALOPECIA.

Syphilitic alopecia requires both internal mercurial and local treatment. The head should be shampooed with the simple tincture of German green soap every second or third day, washed thoroughly and dried, and this to be followed by the application of cantharidal tonic, which is applied daily.

THE NAILS.

Affections of the nails all require internal and local treatment.

In *friable onychia* the nails should be protected from injury and irritation, and carefully pared.

In *perionychia* and separation of the nail from its matrix, mercurial ointment acts well.

In *ulcerative perionychia* the granulations must be touched with the solid stick of nitrate of silver, and the surface dressed with iodoform, calomel and bismuth, mercurial ointment, or the wet bichloride of mercury dressing; at the same time the affected parts should be kept very clean.

MUCOUS PATCHES.

Mucous patches require internal mercurial as well as local treatment. When situated in the mouth, upon the lips, the internal surface of the cheeks, the tongue and the gums, they should be touched every second or third day with the nitrate of silver stick, or three or four times daily with a solution of chromic acid (grains x or xx to the ounce of water).

Those situated upon the tonsils, the palate, the fauces, the pharynx, and the larynx should be *sprayed* with a 5 per cent. solution of nitrate of silver.

During the existence of these lesions, the patient must not smoke or chew, and should keep the mouth and teeth scrupulously clean.

CONDYLOMATA.

Put the patient on anti-syphilitic treatment, and keep the affected parts clean and dry; wash them twice daily with Labarraque's solution, dry, and dust on calomel, and separate them from opposing surfaces by bits of absorbent gauze.

*Cal
lup*

LESIONS OF THE MOUTH AND PHARYNX.

The use of tobacco and alcohol should be interdicted. Mucous patches, erythema and superficial ulcerations require mercury internally, and the local applications already referred to under the treatment of mucous patches.

The tertiary manifestations call for mercury combined with iodide of potassium internally, as well as astringents, and even caustic applications locally.

LESIONS OF THE NOSE.

Secondary lesions of the mucous membrane of the nose yield nicely to internal mercurial treatment, while those involving the deeper structures require the addition of potassium iodide. The parts must be cleaned by sprays, or douches, followed by the application of nitrate of silver solution, and various astringent sprays. Local inunctions of mercurial ointment are also very beneficial.

LESIONS OF THE LARYNX AND TRACHEA.

Laryngeal syphilis in the early stages is best overcome by the "mixed treatment." Local applications are only necessary when there are vegetations or hypertrophy of the mucous membrane, and for these lesions the galvano-cautery or a solution of chromic acid may be employed. For ulcerations, use a solution of nitrate of silver in the spray. If stricture follows the ulcerations, bougies may be resorted to, but are not of much avail. These patients must avoid alcohol and tobacco, and the use of the vocal cords as much as possible.

The tracheal lesions are, as a rule, beyond the reach of local applications, so must be combated by constitutional treatment.

AFFECTIONS OF THE TESTICLE.

The testicles are supported in a suspensory bandage, and the patient put on the "mixed treatment," or potassium iodide combined with local inunctions of mercurial ointment.

The effusion into the tunica vaginalis is generally

absorbed under anti-syphilitic treatment, but if this does not occur, the fluid may be drawn off with an aspirating needle.

LESIONS OF THE NERVOUS SYSTEM.

Syphilis of the nervous system, and especially those lesions which involve the brain and the spinal cord, require *large* doses of potassium iodide, combined with mercury, either internally or by inunction.

AFFECTIONS OF THE LACHRYMAL PASSAGES.

Iodide of potash and mercury should be given together, but besides this the majority of cases require local measures.

One or both canaliculi are incised as far as the caruncle, and dilated with a Bowman's probe; this procedure affords great relief by making a free communication between the sac and the conjunctiva, and also by giving an outlet to pus or any material that has formed in the sac. If there be an obstruction in the nasal passages due to œdema of the mucous membrane, a probe should be passed every few days, and left *in situ* for several minutes, thus restoring the original calibre of the canal.

IRITIS.

The patient should be kept in a shaded, but not darkened room, and go out morning and evening in the open air, with smoked or blue glasses.

In the *acute* form of iritis, the patient must be brought under the influence of mercury as rapidly as possible, without causing impairment of the general health; if

run down, tonics should be used with the mercury, or if the subject be very much depressed, with potassium iodide.

To prevent the formation of adhesions between the iris and the capsule of the lens, the pupil must be kept constantly dilated with a solution of sulphate of atropia (two grains to the ounce of distilled water), this being dropped in two or three times daily; it also relieves the pain and irritation. As some of the atropia solution enters the pharynx through the lachrymal and the nasal passages, care must be taken not to produce its physiological effects. If the iris does not yield to the use of the atropia, leeches should be applied to the temple, or these measures failing, evacuation of the contents of the anterior chamber by paracentesis corneæ must be resorted to. To relieve the pain, mercurial inunctions may be made over the brow and temple, but if it be very severe hypodermatic injections of morphine are required.

For *chronic* iritis, give mercury and potassium iodide, if well borne; but if not, tonics and potassium iodide internally, and mercurial inunctions.

If, in spite of all treatment, the aqueous humor becomes very cloudy, the pain increases, the tension becomes greater, there is a decrease of vision, or if pus forms in the anterior chamber, then paracentesis should be performed; but if the disease still progresses with an increase of all the above symptoms, and extension of the inflammatory processes to the deeper structures of the eye, then iridectomy must be resorted to.

CHAPTER XIX.

GENERAL TREATMENT, HYGIENE, FUMIGATIONS, ETC.

THE treatment of syphilis consists in the use of the specific remedy *mercury*, administered alone during the early manifestations, and combined with potassium iodide in the later ones.

At the same time, the patient's general condition must be carefully watched, and regulated by the employment of hygienic measures and tonics.

The duration of the treatment varies somewhat in different cases, but usually occupies a period of from two to four years, and must be *intermittent*, and not continuous.

Mercury may be administered by the mouth, by inunction, by hypodermatic injection, and by fumigation.

Hygiene. The patient should lead a moderate, regular life, with nourishing and readily digestible diet; alcohol must be given up entirely, or taken sparingly by those who have been accustomed to its daily use; tobacco in all forms must be interdicted, especially when there are lesions of the mouth, the tongue, the fauces, etc., as it causes local irritation of these parts, as well as a depressing influence on the system generally. There should be at least one good evacuation of the bowels every day. Exercise in the fresh air must be insisted upon, as well as bathing in either hot or cold water, whichever is preferable; by these means the secretory apparatus of the skin is kept in good working order.

Do not allow the patient to become depressed or worried about his or her disease, but keep the mind occupied by outside affairs.

Tonics. To combat the chloro-anæmia which occurs in the primary and the early part of the secondary stage, tonics must be administered, such as quinine, iron, gentian, or the fluid extract of erythroxylon coca, which latter preparation has a decided tonic effect on the heart and nervous system generally; these may be given alone or combined with mercury.

The internal use of mercury in the *primary stage* of syphilis, as a rule, does no good, but rather tends to render the development of the manifestations less regular, and very often makes the diagnosis as to whether the patient has had syphilis or not very doubtful.

There are cases however in which mercury *must* be given in the primary stage, and they are formulated as follows:

“1. When the initial lesion, from its size or depth, causes pain, or interferes with the function of the parts, or from ulceration threatens destruction of these parts.

“2. When the chancre, from its situation, may cause the infection of others, as chancres on the fingers of surgeons, midwives, and dentists, upon the breasts or nipples of wet-nurses, the tongues of infants, or the lips of careless persons.

“3. When the lymphatic glands are so enlarged as to cause impairment of motion, or disfigurement.

“4. In all cases where the chancre is complicated with pyogenic infection, and accompanied by pain and fever.

“5. In married persons who are desirous of causing the early disappearance of the chancre.

“6. In subjects who are very nervous and impatient about the sore.

“7. In rare cases which develop cephalalgia, neuralgia, or pains in the bones, joints, and fascia at an early period.”

Mercurial treatment should be commenced with the onset of the *secondary stage*, except in the above classes of cases.

In using mercury it must not be forgotten that in certain instances it is very apt to cause such disagreeable complications as ptyalism and stomatitis, gastro-intestinal disorders, impairment of nutrition, and depression of the vital forces, but fortunately such complications at the present time are rare, as the doses employed are small, and the preparations more carefully selected.

By the mouth. First see that the mouth, teeth, and gums are in good condition. If the stomach is out of order, try and regulate it before using the mercury, unless there is great urgency.

If the drug is to be administered in this manner, which as a rule is most satisfactory, the best preparations are the proto-iodide (green iodide) and the tannate of mercury. Beginning with one pill three times a day, containing one-fourth or one-fifth of a grain of the proto-iodide, or one-half of a grain of the tannate, and either increasing or diminishing the dose according to the exigencies of the case. It is well to add a little extract of hyoseyamus, and citrate of iron and quinine to the mercury in the pill.

The treatment should be continued for from three to four, five, or even six months, if necessary. In the majority of cases, at the end of three months the patient

is doing so nicely that medication may be suspended for one, two, or even three weeks.

At this period the lesions are mild, and consist of patches on the tongues of drinkers and smokers, and persons who have not kept these parts clean, or superficial lesions in those who are subject to simple skin affections.

The next course of treatment generally lasts from two to two and a half months, when the drug may be again discontinued for a time, and then resumed.

During the second year of the disease, iodide of potassium must be combined with either the biniodide (red iodide), or bichloride of mercury, forming the so-called "mixed treatment," to which may be added the compound tincture of cinchona, which counteracts the evil effects of the iodide on the gastro-intestinal mucous membrane. The "mixed treatment" must be given at intervals, in the same manner as the pill, making the periods of freedom from medication longer and longer.

Affections of the brain, spinal cord, viscera, bones, or connective tissue require potassium iodide alone, or combined with mercurial inunctions. In late and obstinate lesions, Zittman's decoction may be used with great benefit; it contains an appreciable amount of mercury, and acts chiefly as a cathartic and diaphoretic; the dose is eight ounces to a pint, during the day.

Inunctions. This is a very efficacious and at the same time agreeable mode of administering mercury, and for the purpose we may use either 50 per cent. fresh mercurial ointment, or 20 per cent. oleate of mercury, which when combined with an equal weight of simple cerate, forms a consistent mass, free from the discoloring

effects produced by the ointment, but more apt to irritate the skin.

The entire body should be thoroughly cleansed with soap and hot water, and the application made just before retiring, after which the part is covered but not washed. A fresh portion of integument is selected each time, care being taken to avoid delicate parts of the skin and those that are exposed to friction, or covered with hair.

The inunctions must be made upon the buttocks, the thighs, the sides of the chest, the internal surfaces of the arms and forearms, the back, or the belly. The applications are made on five successive evenings, then omitted once, when the patient takes a hot bath, and resumes them again on the following evening.

The mouth and teeth should be kept very clean, and the bowels regular, during this course; if there should be the slightest sign of salivation, stop the treatment immediately, and wash the body thoroughly.

For each inunction, use a mass of ointment about the size of the terminal phalanx of the little finger.

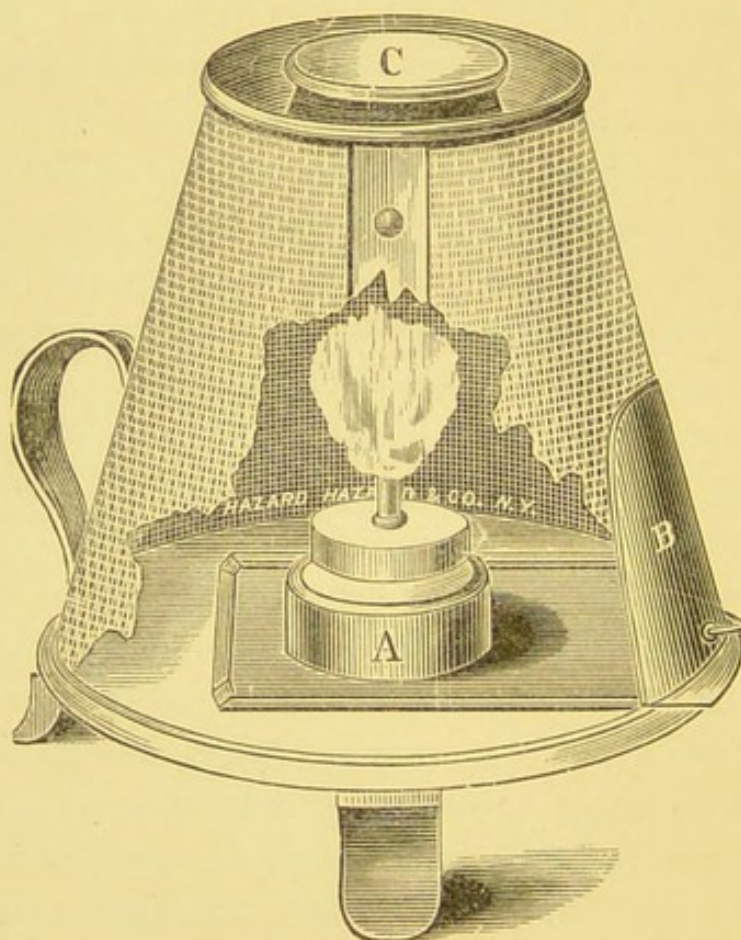
The early syphilides are best treated in this manner, as are also enlarged lymphatic glands, wherever situated. Later and more localized eruptions are greatly benefited by this mode of treatment, also cephalalgias and neuralgias of the early and late stage. In optic neuritis, neuro-retinitis, retinitis, and choroiditis, local inunctions are of marked benefit, especially when combined with potassium iodide internally.

Fumigation. Fumigations are of great value in the chronic, the localized, the general, and also the late eruptions of syphilis.

The mercurial vapor is best generated from *calomel*, placed on a Lee's lamp.

The purest calomel must be employed, as the free hydrochloric acid it contains is very irritating to the respiratory organs. The bath should be taken at night just before retiring, and one-half a drachm of calomel used.

FIG. 31.



Lee's lamp.

The patient sits undressed and covered with blankets on a cane-bottom chair, beneath which is the lamp; in a few minutes profuse perspiration comes on, the calomel being completely evaporated in twenty minutes; the lamp is then extinguished; the patient remains on the chair a few minutes longer, and then retires in the same blanket, without being rubbed.

The bath may be given every night, or one to three times weekly, according to the strength of the patient and the amount of mercurial effect desired. The patient should wear flannel underclothes, follow the hygienic rules already laid down, and take small doses of mercury, or the "mixed treatment," combined with tonics, if indicated.

The syphilitic manifestations generally disappear in about three weeks, but the baths must be continued for several weeks longer.

Hypodermatic injections. The treatment of syphilis by hypodermatic injections is very useful, and may be regarded as a valuable addition to the above-described methods; it is also serviceable in cases where we require the speedy action of the drug.

Its general adoption as a means of treatment cannot be recommended, as the injections are followed by pain, soreness, indurated nodules, and in some cases by abscess.

The best preparation is a watery solution of the bichloride of mercury, used in *two* strengths; one contains one-twelfth of a grain of the drug in ten drops of water, and the other one-eighth of a grain of the drug in ten drops of water.

The injections are given close to the lesions, if their rapid disappearance be desired, as is the case when they are situated upon the face, the neck, the hands, or the wrists.

The best places for making the injections are the infra-scapular regions, the loins, and the upper portions of the nates. It is better to wait a day or so after each injection before giving another, in order to test the susceptibility of the patient.

This method gives good results in cephalalgias, in the early eruptions, and in cases where mercury is not well borne by the stomach.

In ocular troubles the injections are of great benefit, as is also the case in osseous, bursal, fascial, and articular lesions, especially the early ones, at the same time giving potassium iodide in full doses.

SALIVATION.

During a course of mercurial treatment some subjects are liable to become salivated, the first symptom being soreness of the gums just behind the superior incisors, and in the lower jaw back of the last molars; the other symptoms of mercurial stomatitis are a metallic taste in the mouth, fetid breath, increased flow of the saliva, tenderness of the teeth when closed upon each other, swelling of the tongue, which is marked by the teeth on its sides, oedema of the mucous membrane of the cheeks, gums, and lips, with difficulty in articulation and deglutition. The neighboring lymphatic glands may become enlarged. Sometimes there is fever, accompanied by general malaise. In rare and extreme cases there is ulceration of the soft parts, which may or may not be followed by necrosis of the maxillary bones.

If salivation occur, the mercury must be stopped immediately, the bowels kept freely open, and the patient put on a liquid and nourishing diet. For a gargle and mouth-wash use a solution of chlorate of potash (two drachms to a pint of water); this must be employed frequently, and a small portion may be swallowed several times during the day.

Iodide of potash has a very decided effect upon the

lesions of the transition and tertiary stage, but as it subdues rather than removes them, it is best to combine it with mercury, either internally or in the form of inunctions.

The dose of the iodide in the beginning should be five to fifteen grains, three times a day, a half-hour after meals; but this may have to be increased to one, two, or even three hundred grains daily.

Some patients cannot tolerate the iodide internally, so we are obliged either to abandon its use temporarily and substitute mercurial inunctions, or give it hypodermatically, or mix it with vaseline, and apply as inunctions.

In some instances it causes coryza, pain in the frontal sinuses, œdema of the conjunctiva, swelling of the lids, irritation of the fauces, gastro-intestinal derangements, eruptions on the skin, most commonly papules, acne pustules, or furuncles, and which, as a rule, are situated upon the face and the neck. All the above complications rapidly subside on the temporary suspension of the drug.

In large and long-continued doses iodide of potassium gives rise to a condition known as *iodism*, which consists of a feeling of oppression in the head, tinnitus aurium, neuralgia, spasmodic muscular action, impairment of voluntary motion, and sluggish intellect.

DURATION OF TREATMENT.

Treatment should be continued as long as any syphilitic manifestations remain, and for at least two years or two years and a half, even in those cases that have had no symptoms since the general outbreak.

After a proper course of medication, the majority of cases are cured ; but it must not be forgotten that this is not always the case, and that the late manifestations are the most dangerous, especially the lesions of the brain and the arteries.

CHAPTER XX.

HEREDITARY SYPHILIS.

HEREDITARY syphilis, also known as congenital and infantile syphilis, is that variety in which the disease is transmitted to the child *in utero* from either one or both parents.

As a rule symptoms appear about the *third week* of life, but sometimes occur at birth, or as late as the third month, and in some instances even later.

If both parents are syphilitic, the foetus generally dies, or the child manifests symptoms at a very early date.

The severity of the disease decreases with each succeeding child, and as a rule is only transmitted to the second generation, unless very severe, when it may be transmitted to the third.

There is *no initial lesion* nor are there any regular stages in hereditary syphilis; the lesions are more hyperæmic and active than in the acquired form, and attack every organ and tissue.

Hereditary syphilis may be derived from one or both parents. If procreation occur while the father is in the first period of incubation, the child will escape infection, and *may* do so even if he be in the second period of incubation, but will always be infected if he has secondary manifestations; although mercurial treatment may so modify the disease that the child will escape, even during the first year. A syphilitic father can

transmit his disease to the child, the mother escaping infection, and remaining in a perfectly healthy condition.

The mother may also transmit syphilis, but her disease must be constitutional. "The syphilis of the mother acquired during pregnancy cannot be conveyed to the foetus through the utero-placental circulation." The mother cannot be infected by a syphilitic foetus through the utero-placental circulation.

Syphilitic women are very liable to abort, and generally do so between the fifth and seventh months.

The severity of the disease in the child is in proportion to its intensity in either one or both parents at the time of its conception.

The *course* of the disease is chronic and very irregular. Superficial and visceral lesions may be present at the same time.

The *duration* of hereditary syphilis depends upon the intensity of the disease and the treatment employed. Some children are healthy at the end of a few months, others in a year, and others not until the tenth or twelfth years.

The *mortality* of syphilitic children is very great—about one-third perishing before maturity. Abortion caused by the death of the foetus takes place at about the sixth month. The foetus is usually macerated, of a purple color, with various visceral lesions, and bullæ upon the soles and palms.

Syphilitic stillborn children, or those dying soon after birth, frequently have no cutaneous lesions.

The majority of syphilitic children born alive look perfectly healthy, but at about the end of the third week the disease manifests itself.

CHAPTER XXI.

LESIONS OF HEREDITARY SYPHILIS.

THE principal eruptions of hereditary syphilis are the erythematous, the papular, the vesicular, the pustular, the bullous, and the tubercular syphilides.

THE ERYTHEMATOUS SYPHILIDE.

The erythematous syphilide, or roseola, is the first eruption, and appears about the third week of life; it may be preceded by or accompanied with *coryza*. Beginning upon the lower portion of the abdomen as pink spots, the eruption finally invades the trunk, the face, and the extremities; the spots gradually assume a dull-red, coppery color, which does not disappear on pressure, owing to the pigmentation of the skin. As a rule there is no elevation or desquamation of the spots, except in severe cases, or when they are situated upon the palms, the soles, or the nates. In some instances the spots coalesce, forming fissures which may or may not be painful. The eruption may be so faint in some cases as to escape observation.

THE PAPULAR SYPHILIDE.

This syphilide is sometimes the first to appear, or may be intermingled with the erythematous eruption. The lesion consists of large and small flat papules, scattered

over the body. Grouping is infrequent, except at a late period, and is then seen about the joints and on the extremities. The papules are coppery-red in color, and may exfoliate, especially when situated upon the palms or soles. The eruption yields readily to treatment.

CONDYLOMATA LATA.

Condylomata lata are really nothing more than modified papules, which, being situated between opposed surfaces of skin at muco-cutaneous junctures, or wherever there is moisture, become hypertrophic. They vary in size and shape, are of a grayish-pink or brown color; the surface is flat, sometimes fissured and ulcerated, with an offensive secretion; they appear early, run a chronic course, and are most frequently encountered about the anus. With proper treatment they disappear, leaving copper-colored pigmentations, which finally fade.

THE VESICULAR SYPHILIDE.

This syphilide is rare, and occurs as an early manifestation. It appears in groups, situated upon the chin, about the mouth, upon the forearms, the nates, the hypogastrium, and the thighs, and is usually associated with a bullous or pustular eruption.

The vesicles may be large or small, are situated upon an infiltrated base of a brownish-red color, and contain serum, or sero-purulent fluid.

It is readily influenced by treatment, and does not tend to relapse.

THE PUSTULAR SYPHILIDE.

This syphilide generally appears before the eighth week; it may involve the entire body, but it is usually

most marked upon the thighs, the buttocks and the face.

The pustules vary in size, and are situated on a thickened, deep-red base; they sometimes rupture, leaving an ulcerated surface, which may or may not become incrustated.

Those about the mouth have a tendency to coalesce. Groups of pustules are liable to form in the palms or soles, or develop around the nails, and finally destroy them. If the scalp is invaded by the eruption, there is usually some resulting alopecia.

FURUNCULAR ERUPTIONS.

Furuncles are liable to appear as early as the sixth month, or as late as the third year, and may either be alone or associated with other lesions.

They form slowly and without any signs of inflammation, the base being of a coppery-red color. Superficial ulceration occurs on the apex, leaving a deep ulcer, with everted margins, and a scanty, offensive secretion. These ulcers remain from one to several months, frequently leaving permanent cicatrices.

THE BULLOUS SYPHILIDE.

The bullous syphilide, or pemphigus, always indicates a severe, and often fatal form of hereditary syphilis; it may occur at birth, or from a month to six weeks afterward.

The palms and soles are most frequently invaded, although any portion of the body may be attacked.

The bullæ are conical, rounded, or flattened, and con-

tain sero-purulent fluid, which soon becomes purulent; the surrounding skin is thickened, and of a copper color. After rupturing, their course is chronic like that of the pustules. Relapses are very rare.

THE TUBERCULAR SYPHILIDE.

This eruption may occur as early as the sixth month, or even several years after birth.

It begins as deep-seated nodules or papules; these implicate the integument, forming sharply circumscribed tumors, which either disappear, or break down into chronic ulcers. The surface of the tubercles may be scaly, looking somewhat like psoriasis. They are usually found where the connective tissue is loose and abundant.

GUMMATA, AND GUMMATOUS ULCERS.

These manifestations of the disease usually occur between the third and the twentieth years. Their course is similar to those in the acquired form.

THE MUCOUS MEMBRANES.

One of the first symptoms of hereditary syphilis is *snuffling*, accompanied by a profuse or scanty serous discharge from the nostrils, which is due to a structural change in the nasal mucous membrane.

The secretion becomes purulent, bloody and offensive, causing œdema and excoriation of the nose and the upper lip, upon which crusts may form.

The lesion begins as a simple erythema of the mucous membrane, ulceration ensues, and the disease may then

extend to the bony and cartilaginous framework of the nose, causing its destruction, with more or less resulting deformity.

MUCOUS PATCHES.

These lesions are at first whitish in color, elevated and surrounded by an erythematous border; the epithelium is soon removed, leaving a slightly depressed, red surface, which may or may not undergo ulceration.

They are most commonly situated at the angles of the mouth, upon the mucous membrane of the cheeks, the fauces, the tonsils, the sides and dorsum of the tongue, and on the gums, near the teeth.

The secretion from the patches is free, serous in character, and highly contagious, so that great care must be exercised to guard against the infection of others.

Mucous patches are very prone to relapse, and this is sometimes observed even as late as the sixth year.

GUMMATOUS INFILTRATIONS.

These lesions generally occur between the third and the twelfth years.

They consist of a cellular infiltration of the mucous membrane, which at first becomes reddened and elevated, and finally develops into well-marked tumors, which usually break down into undermined ulcers, with greenish, thick secretion.

Their favorite sites are the hard palate and the posterior pharyngeal wall.

The course of these lesions is chronic.

THE RESPIRATORY ORGANS.

THE LARYNX.

During the early periods of syphilis, the larynx may be the seat of simple hyperæmia, of mucous patches, or of ulceration, which involves either the mucous membrane alone, or the cartilages beneath it.

Gummatous infiltrations of the larynx belong to the later stages, and require full doses of the iodide of potash.

THE LUNGS.

Upon the surface of the lung, and scattered through its substance on the smaller vessels and bronchi, are numerous nodules, differing in size, and varying in color from a grayish-pink to a light yellow; the pleura near these nodules becomes opaque and thickened.

An entire lung, or only portions of a lobe, may be involved.

The morbid process begins by congestion, followed by cell-proliferation around the bronchioles and in the walls of the capillaries, causing partial or complete occlusion of their lumen, and destruction of the function of the lung. The nodules consist of connective-tissue cells, of fibrous and of gummatous tissue, and may undergo fatty or caseous degeneration.

True gummatous nodules do sometimes occur.

These lesions are most frequently encountered within the first eighteen months of life.

THE ALIMENTARY CANAL.

It is thought by some observers that the chronic diarrhœa met with in syphilitic children is due to an

erythema of the gastro-intestinal mucous membrane, similar to the erythema occurring in the mouth and pharynx.

THE LIVER.

The liver may be the seat of a connective-tissue infiltration, which renders it hard, globular and hypertrophied; these changes are either circumscribed or general.

This new indurated tissue causes the capillaries to become obliterated, and the calibre of the larger vessels to be diminished, and also compression of the cells of the acini, with the cessation of the flow of bile.

Gummatous hepatitis occurs either as numerous small tumors, scattered through the substance of the liver, or as one or more isolated tumors.

THE SPLEEN.

During the early stages of the disease the spleen may become more or less hypertrophied, but yields readily to mercurial treatment.

The enlargement is very great, rapid in its course, and most marked in cachectic children, and those in whom the disease is of a severe type.

THE PANCREAS.

The organ may be enlarged and firm in consistence. The interstitial connective tissue is increased, especially between the larger lobules, causing compression of them, with atrophy, and fatty degeneration of their epithelium.

THE GENITO-URINARY ORGANS.

THE KIDNEYS.

The lesion consists of a diffuse or circumscribed infiltration of round embryonic cells, with others of fusiform shape, into the connective-tissue framework, followed by compression or destruction of the tubules and colloid degeneration of their epithelium ; the organs are at first enlarged, but gradually become greatly reduced in size.

The supra-renal capsules sometimes become enlarged, owing to the proliferation of young connective-tissue cells.

THE TESTICLES.

When these organs are affected, the disease consists of a chronic, painless enlargement of one or both testes, generally accompanied by hydrocele and hyperæmia of the scrotum. The epididymis and cord are sometimes involved.

The lesion consists of a connective-tissue proliferation, either interstitial or diffuse.

If commenced at an early date, mercurial treatment causes speedy resolution, but if neglected, atrophy or degeneration with abscess formation, followed by fungous protrusion of the testicle, may occur.

In all probability the *ovaries* are affected in a similar manner.

THE SHEATHS OF THE TENDONS.

The sheaths of the tendons may become swollen and filled with fluid, the overlying skin being distended and reddened. This affection comes on rapidly, is not

readily influenced by anti-syphilitic treatment, and runs a chronic course.

THE NAILS.

Affections of the nails are more frequent in hereditary than in acquired syphilis.

There are two forms of onychia—the ulcerative and the nutritive.

Ulcerative onychia usually occurs during the first and second years of the disease, but may appear much later.

It is the most common form, and begins at the side or base of the nail as a papule or pustule, which ulcerates and extends along the base or margins of the nail, and finally involves the matrix, which results in the loss of the nail, thus leaving an unhealthy-looking ulcer, with sanious discharge. The terminal phalanx becomes red, enlarged and painful.

The nails of the fingers are more liable to be attacked than those of the toes.

Cicatrization of the ulcer, without the formation of a new nail, sometimes follows, or a deformed and useless one may grow.

The course of this affection is chronic, unless shortened by mercurial treatment.

Nutritive onychia is a later and more chronic manifestation.

It commences as a coppery-colored swelling at the margin or base of the nail, which soon becomes thickened, fissured and brittle, dirty-white in color, with hyperæmia of the matrix and adjoining tissues. There is usually some deformity of the phalanx, which may or may not be permanent.

THE TEETH.

The permanent teeth in hereditary syphilis present certain peculiarities, especially the central upper incisors of the second set, which are known as *Hutchinson's teeth*, or *test teeth*.

FIG. 32.

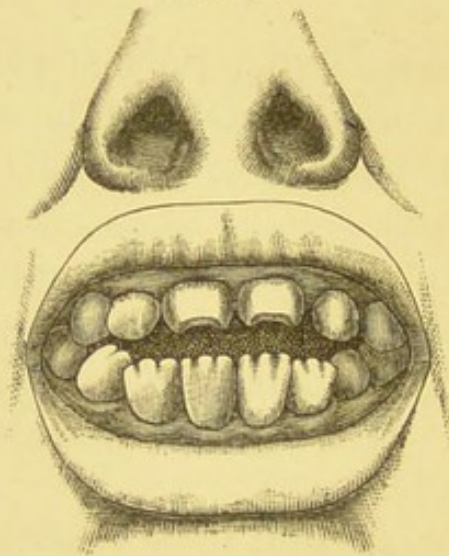


FIG. 33.



Hutchinson's teeth.

In describing these teeth Mr. Hutchinson says: "When first cut, the teeth are usually short, narrow from side to side at their edges, and very thin. After a while a crescentic portion from their edge breaks away, leaving a broad, shallow, vertical notch, which is permanent for some years, but between twenty and thirty usually becomes obliterated by the premature wearing down of the tooth. The two teeth often converge, and sometimes they stand widely apart. In certain instances in which the notching is either wholly absent or but slightly marked, there is still a peculiar color ('a dirty-brownish hue resembling that of bad size'), and a narrow squareness of form, which are easily recognized by the practised eye."

The first or temporary set of teeth do not show this malformation, and many children suffering from hereditary syphilis have perfectly normal teeth.

THE HAIR.

Affections of the hair in hereditary syphilis are very like those in the acquired form. Alopecia areata occurs with lesions of the scalp, especially the pustular syphilide.

THE LYMPHATIC GLANDS.

In hereditary syphilis there is no general subacute adenitis, as in the acquired form, although groups of glands may be enlarged if they are in relation with active lesions.

THE BONES.

Osteo-chondritis. This affection occurs either in the first months of the disease, or as late as the twelfth year, and is a very constant manifestation of hereditary syphilis.

It most commonly attacks the bones of the forearm, the leg, the arm and the thigh, but the clavicle, the sternum, the ribs, the metacarpal and the metatarsal bones may also be involved.

The lesion is situated at the diaphyso-epiphyseal junction, and consists of a ring-shaped swelling around the end of the bone. In some cases the entire epiphysis may be enlarged, with or without the ring formation at its junction with the shaft. If two bones are affected, as those of the forearm or the leg, they appear to be fused together by this process. The distal ends of the bones are more frequently attacked than the proximal.

The lesion develops slowly in some cases, and rapidly in others ; causes but little pain, interferes only slightly with motion, and disappears under proper treatment. The integument is not involved unless the mass be very large, when it is rendered tense and painful. The joints may be secondarily invaded, especially the elbow- and knee-joint.

In some cases the lesions degenerate and break down, causing ulceration of the integument ; the epiphysis may be separated from the shaft and destroyed, likewise the cartilage. In other cases resolution of the swellings occurs, and the bone returns to its normal condition, but if the intermediate layer of cartilage be destroyed, the bone is usually shortened.

Periostitis is a later affection, and usually appears between the fourth and the nineteenth years.

Any of the long bones may be affected, and in some cases those of the skull also. The bone becomes tender, enlarged and curved anteriorly ; the process may involve the entire length of the shaft, or be localized and produce nodes. One or both limbs can be thus affected.

Dactylitis. The lesions are the same as in the acquired form of syphilis, and consist of swelling of the phalanges, the metacarpal and the metatarsal bones in the early months of the disease, or even as late as the twentieth year.

The proximal phalanges are more often attacked than the distal ones. The course of this affection is chronic, unless treated, when it responds nicely.

THE JOINTS.

In some cases of osteo-chondritis there is a serous effusion into the neighboring joint, which becomes

slightly painful on account of the tension; resorption and complete recovery usually ensue. The elbow, the wrist, the shoulder, the knee and the ankle are most frequently involved, although almost any articulation is liable to invasion.

In the latter years of syphilis the larger joints may be affected either primarily or secondarily to lesions of the bones. The process is slow, the joint being greatly distended and slightly painful; the surrounding skin remains normal. With the proper treatment resolution generally takes place, leaving a good articulation.

THE EYES.

In hereditary syphilis the eyelids and the eye itself are liable to all the lesions which occur in the acquired form, and which have already been described under that heading. These affections appear at a very early date.

THE EARS.

The occurrence of sudden deafness in children who have hereditary syphilis is quite common. It is apparently due to disease of the nerves, or of their distributions in the labyrinth. The changes in the external parts, or the membrana tympani, are not sufficient to account for it; the Eustachian tubes also remain normal.

This affection is usually observed from about five years before puberty to the same length of time after it. The prognosis is unfavorable.

THE NERVOUS SYSTEM.

In hereditary syphilis inflammations of the meninges and endo-arteritis have been observed ; also gummata upon the membranes.

Chorea sometimes occurs, and is either mild or severe in character ; it may be accompanied by hemiplegia or epilepsy. In these cases it is thought that the hemiplegia is caused by plugging of the middle cerebral artery ; that the chorea is due to occlusion of its small distal branches, and that the epilepsy is occasioned by thickening of the meninges or gummata, in or near the corpus striatum.

Epilepsy may occur alone, and has been observed as late as the fifteenth year.

There is sometimes paralysis of the cranial nerves.

In their evolution and course, the affections of the nervous system in hereditary syphilis resemble those in the acquired form of the disease.

HEMORRHAGIC SYPHILIS IN NEWBORN CHILDREN.

This condition exists at birth, or not later than the first month of life, and is frequently the only manifestation of the disease, but may be accompanied by other lesions.

It is due to the imperfect coagulation of the blood, and is generally observed in children whose parents are profoundly syphilitic.

In some cases there is a small, subcutaneous hemorrhage in parts exposed to friction or pressure, while in other cases it occurs in or upon mucous membranes, and may be profuse or even fatal.

Trifling wounds or bruises are sometimes sufficient to cause an alarming hemorrhage.

PROGNOSIS OF HEREDITARY SYPHILIS.

The prognosis of hereditary syphilis is unfavorable, and depends greatly upon the condition of the parent or parents at the time of conception, and the intensity of the lesions in the child.

CHAPTER XXII.

TREATMENT OF HEREDITARY SYPHILIS.

If a pregnant woman be syphilitic, she should be put upon the "mixed treatment," or if there is gastro-intestinal irritation, inunctions of mercurial ointment may be used.

If the father was syphilitic at the time of impregnation, or showed any manifestation of syphilis before it, then the mother must have anti-syphilitic treatment.

In treating syphilitic infants, great care must be used, as internal medication is liable to set up gastro-intestinal irritation, and inunctions are often precluded on account of the delicacy of the skin.

Treatment of the child through its nurse is very unsatisfactory, and should not be relied on.

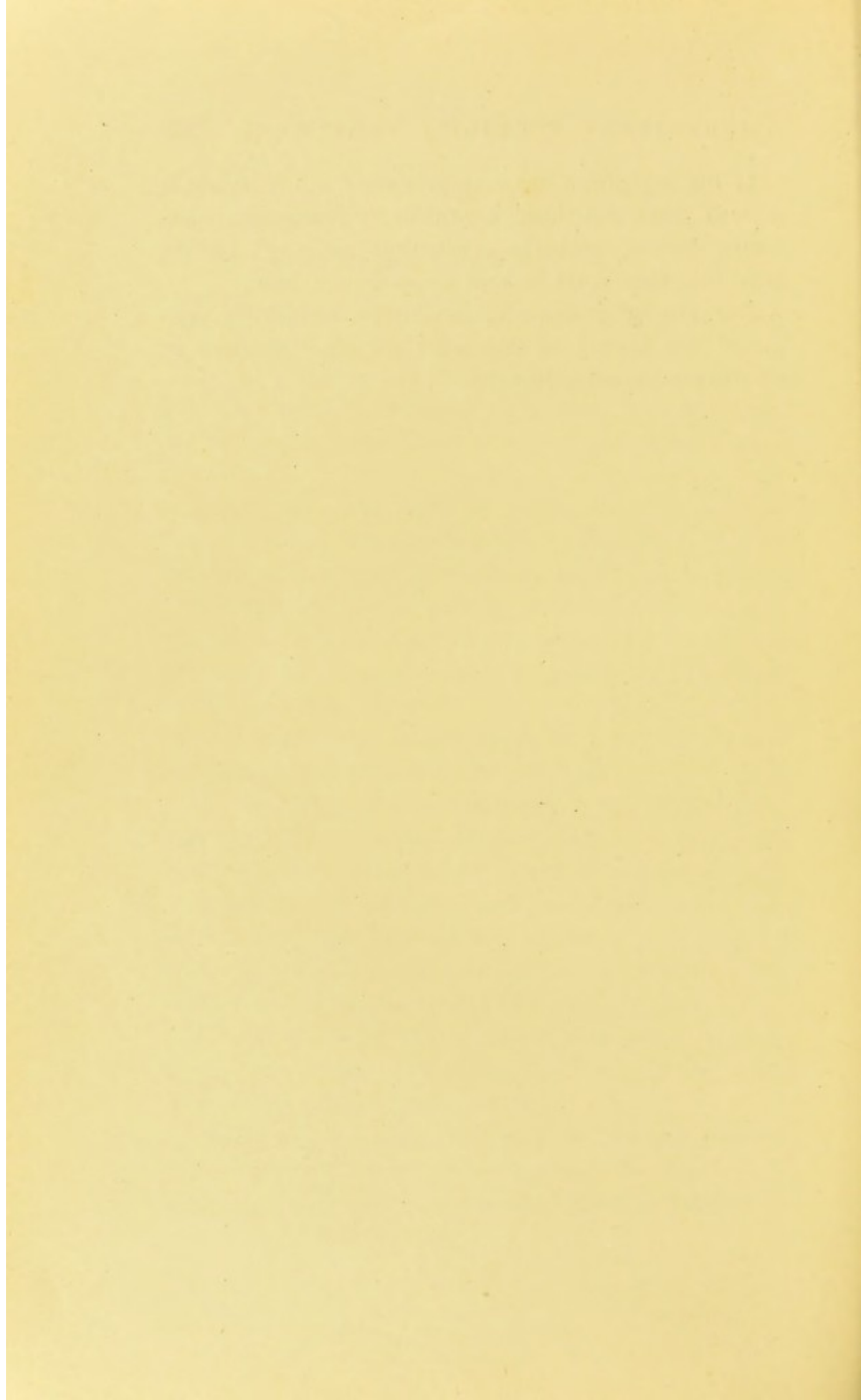
The best preparation of mercury is the proto-iodide (green iodide), in doses of one-twentieth up to one-tenth of a grain, three times a day, mixed with sugar of milk or subnitrate of bismuth, and suspended in a little water; one-grain doses of the lactate of iron may be combined with this, and acts very nicely in some cases as a tonic; this is also true of the iodide of iron.

For *inunctions* we may employ either mercurial ointment, or the 10 per cent. oleate of mercury, using from ten to thirty grains every other day.

Lesions of the bones, the joints, the nervous system, and the viscera require a combination of the biniodide of mercury and the iodide of potash, beginning with small doses well diluted in water.

If the syphilides are very persistent, much benefit is derived from their local treatment by fumigation, ointments, lotions, or baths containing mercury; at the same time they must be kept scrupulously clean.

Duration of treatment. Treatment should be continued for several months after all manifestations of the disease have disappeared.



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