Chronic urethritis and other affections of the genito-urinary organs : three lectures deivered at the Royal College of Surgeons in June 1889 / by Matthew Berkeley Hill.

CHRONIC URETHRITIS
AND ITS TREATMENT

BERKELEY HILL

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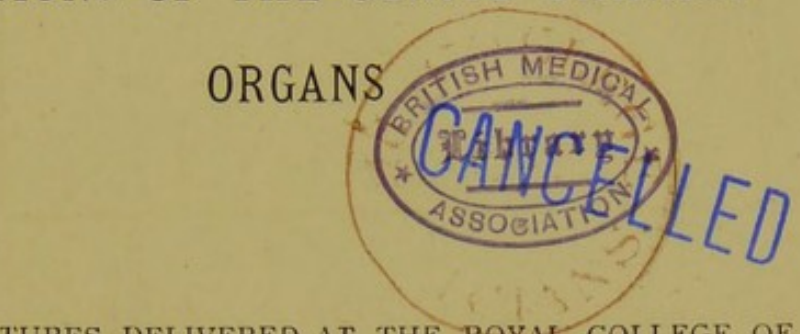

THREE LECTURES DELIVERED AT THE ROYAL COLLEGE OF SURGEONS IN JUNE, 1889

BY

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PREFACE.

The following lectures were delivered at the College of Surgeons with the object of describing the forms of chronic urethritis as seen by reflected light, and the treatment of the troublesome discharge termed gleet, mainly by topical methods. Some description is also given of forms of prostatitis and of some affections at the base of the bladder, with the author's experience in their treatment. The present issue has been revised since the publication of the Lectures in the Illustrated Medical News in January, 1890.

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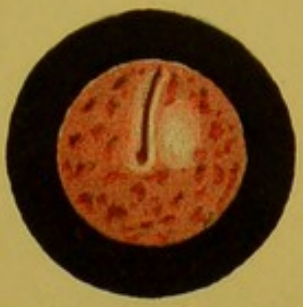

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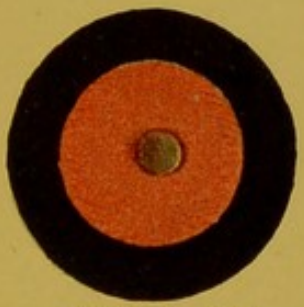

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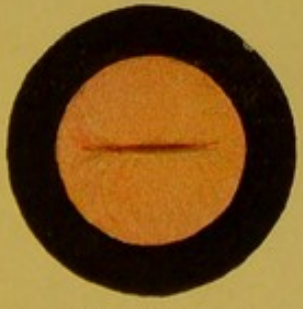

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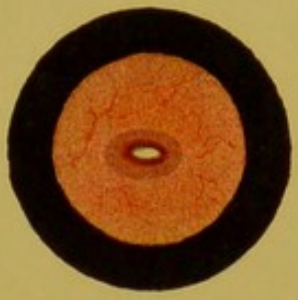

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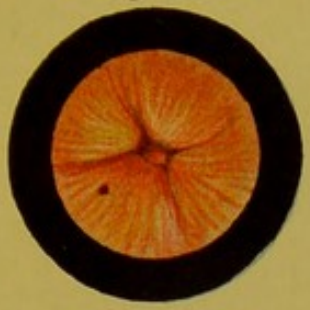

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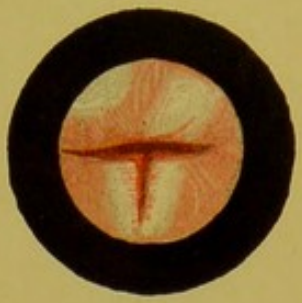

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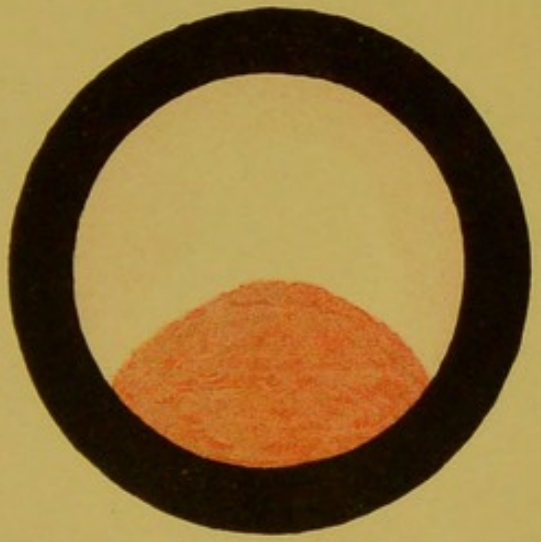

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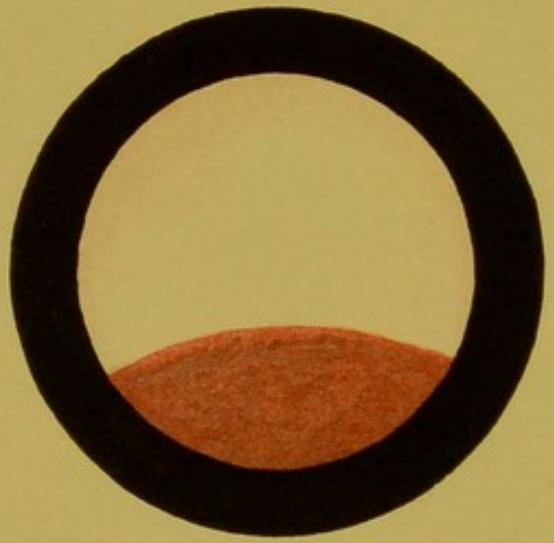

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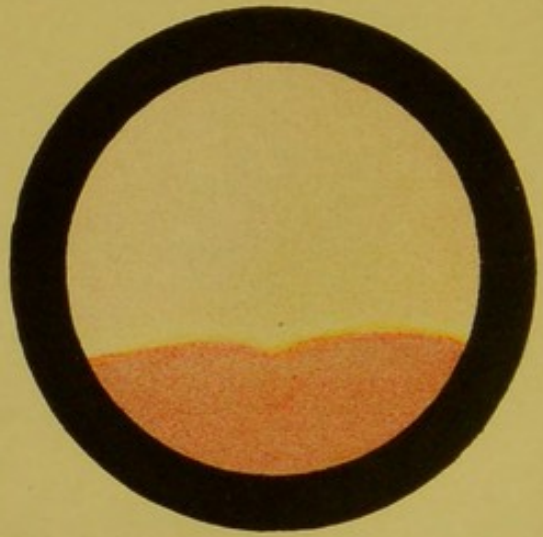

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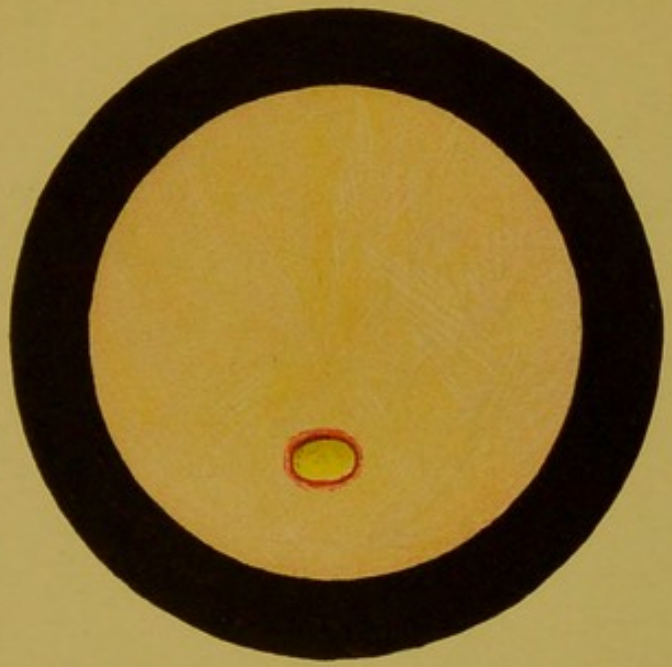

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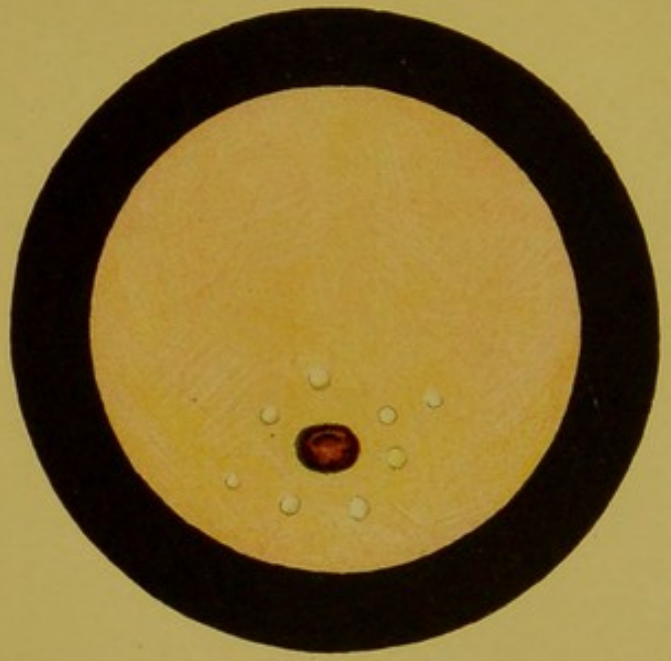

The Ulcer after Healing

CHRONIC URETHRITIS.

LECTURE I.

The Healthy Urethra.

BEFORE describing the condition of the urethra in chronic inflammation, I will ask your attention to a short sketch of the expansibility and appearances of the healthy urethra which are learned by instrumental and endoscopic examination.

The Expansibility of the Healthy Urethra.

When at rest the walls of the urethra are drawn closely together by their elastic and muscular contractility. They so remain until separated by a stream of urine or by some foreign body passed along the canal. As the flow of urine or other body passes outwards the walls close again immediately behind it. This statement, though true for the greater part of the canal, is not quite so for the prostato-membranous portion. The complete evacuation of this part is achieved by certain muscles that are under voluntary control. Also at the last half or three-quarters of an inch the walls of the canal do not fit quite closely together. The elastic tension of the urethra will yield readily before a sound of greater size than that of the largest stream, and the calibre of the urethra consequently depends on the amount of distending force applied to the walls. Hence the ordinary size of the urethra may be taken to be the width to which the closed tube must be dilated to give the urine an unimpeded passage when driven from the bladder. What the width should be to prevent injurious action of the walls of the bladder I have never quite satisfied myself. Probably it varies in different persons. I have seen, post-mortem, healthy kidneys and

undilated ureters and no apparent increase of thickness of the muscles of the bladder in a man who had a stricture which he kept to No. 8 English for years before he died. On the other hand, cases are not infrequent where a less amount of narrowing in the urethra is attended by marked renal disease and by hypertrophy of the muscles of the bladder. I think, as a rule, a stricture that admits the passage of a bougie the size of No. 10 or 12 of English scale (20-22 mm.) would allow the urine to escape without putting the bladder to unnatural exertion.

The natural expansibility of the urethra varies in different parts of its length; in the prostatic and membranous portions it is greatest, having there a circumference of at least 50 or 60 mm., sometimes more, and thus it allows of the passage of a man's forefinger into the bladder. As the urethra passes through the triangular ligament it often narrows a good deal. In some cases I have found the urethra at the triangular ligament to expand only 25 mm., though in other parts the canal was not less than 30 mm. At the bulbous portion the urethra permits of greater expansion for about 2 inches of its length, and then contracts slightly in the last 3 inches up to the meatus, which is commonly the narrowest point of all. As the penis varies in circumference in different persons, so does the urethra in distensibility, the range of dilatability being between about 20 and 40 mm. The usual expansibility is 34 mm.

The size of the meatus varies very greatly, being in some a mere pin-hole, in others 40 mm. round. The common circumference is 25 mm., or almost exactly 1 inch.

To ascertain the expansibility of the urethra, or the existence and position of unyielding parts, the following instruments are necessary: a set of bullet sounds, some with slender stems, some with flexible ones, carrying bullets shaped like a turkey's egg, and ranging in circumference at the thick end from 8 to 40 mm. Besides these sounds, it is useful to have an Otis's urethrameter. This instrument can be enlarged from 12 mm. (about No. 6 of the English catheter scale) to 44 mm. By means of the meter the urethra can be measured in cases of narrow meatus, or when a contraction prevents the ordinary bullet sound from reaching the deeper portions of the canal. The meter cannot be readily introduced beyond the triangular ligament, and therefore is most useful as a gauge of the penile portion of the duct. Fortunately, it is seldom wanted for examining the membranous portion. The bullet bougies

with wire stems can be bent to suitable curves, and, with a little management, passed to the bladder without giving pain.

The Aspect of the Healthy Urethra.

When viewed through the endoscope the living urethra varies much in its different parts; and for purposes of description it may be divided into a spongy or penile portion, and a membrano-prostatic portion. The spongy portion reaches from the triangular ligament to the meatus, say the last six inches of the canal.

The Spongy Portion.

The Lumen.—When at rest, the walls are in close apposition, and the so-called "lumen" varies in form at different parts of the passage. For about five inches from the bulb it is transverse and linear, or slightly oval; for the last inch the lumen is either vertical or triangular, or even crescentic with the concavity of the arch upwards at the navicular fossa. At the meatus, as we all know, it is vertical.

The colour of the mucous membrane varies between pale greyish pink or pale bluish pink and a full bright pink, as the individual to whom it belongs is dark or fair (see fig. 1). Just at the orifice the hue is bluish pink, similar to that of the glans generally. A dark man, or one of lymphatic complexion, will have a pale urethra, whilst a fair man will have a bright-tinted one. The colour of the mucous membrane of the urethra is generally like that of the buccal and labial mucous membranes in the same person. Also, its brilliancy or shining aspect resembles that of the mouth. When the endoscope tube has been passed along the canal for six inches, and is slowly withdrawn, the walls of the urethra are seen to contract behind it closely. As it contracts two longitudinal folds or furrows form in the floor close behind the retreating tube. These furrows are very shallow, and resemble lines slightly darker than the rest of the disc of membrane, which is visible through the tube. They have a constant position, and by that are distinguished from ridges of granulations which have no fixed relation to the floor. In many urethræ, possibly in all, the roof and sides of the canal appear to be delicately striated. These striæ are much less easily detected than the two furrows seen in the floor. They are a little brighter in tint than the neighbouring surface.

In addition to these striæ, fine papillæ may be observed, mainly along the lines of the furrows, and are most easily re-

cognised in the deeper portion of the passage, being no longer seen when the navicular fossa is reached. No bead of muco-pus occupies the centre of the lumen in health, as is almost constantly the case in disease. The healthy mucus is colourless, and simply gives gloss to the surface. In health the orifices of the racemose glands of Littrè are not visible, and those of the lacunæ of Morgagni are not readily discovered, though they may be detected as little pouch-like recesses. When inflamed they are distinct enough.

Of important characteristics of the healthiness of this part of the urethra, one is the evenness with which the walls of the passage contract behind the retreating tube, or expand when it is advanced. A very limited amount of thickening or toughening of small areas of the walls causes them to fall together by flops and jerks. The second characteristic is the general brilliancy or gloss of the surface; a very scanty secretion of pus destroys the lustre. A third characteristic of health is the generally oval or linear form of the lumen, except at the last inch of the urethra.

The Membrano-prostatic Portion.

The Lumen.—At the triangular ligament the lumen is often tripartite, but this form is somewhat due to the fixed attachment of the passage at that point. In the membranous part the lumen of the prostatic portion is saddle-shaped from the upward projection of the verumontanum.

The colour of the mucous membrane of this part is more red than pink; and over the prostate the surface is darker, with a tinge of blue associated with the pink; fine longitudinal lines or ridges are often very obvious on the bluish pink ground. It must be confessed that the difficulty of passing the tube into this region renders slight chafing of the surface very common, and a stain of blood may make the surface look redder than it really is if the moisture be not mopped away carefully. The brilliancy of the surface is less than that of the mucous membrane in the anterior portion of the canal.

The papillæ are larger, and give to the membrane a granular appearance. Sometimes in the prostatic portion the openings of ducts can be seen, but not with such precision as to enable the observe always to determine which particular ducts are in view. The central depression leading to the prostatic utricle appears when

the highest part of the veru-montanum is in view as a short black line. Just anterior to the uvula vesicæ the same general aspect obtains. The lumen at the exit of the bladder is horizontal, but branched at either end. Sometimes large dark blood-vessels can be descried under the surface. The shape of the urethra at the membrano-prostatic portion is much affected by the muscles which surround it; so that even while under observation it is sometimes round and sometimes flat. The floor is generally ridged and may be slightly hollowed like the bowl of a spoon. The changes of shape in the prostate, even while the patient lies quite still, are very distinct.

Morbid Changes in Urethritis.

In urethritis the inflammation may invade the tissues in several ways. The simplest form spreads over the surface only of the membrane, a veritable mucous catarrh. The more severe forms attack the whole thickness of the membrane and the submucous tissue, and pass even beyond that into the erectile tissue. Another form chiefly affects the glands of Littrè and the lacunæ of Morgagni.

Besides the glands of Littrè, there are some glands near, which open the meatus by long ducts, which occasionally become inflamed, and when so are very slow to heal. These ducts are not always to be distinguished, but they are most easily seen in persons who have slight hypospadias. In such persons they may be seen as small orifices, along which a canaliculus probe will pass for about half an inch, and from which muco-pus slowly exudes. If a canaliculus director be passed along, and the duct slit up from end to end, a cure is quickly effected, but injections of nitrate of silver, irritation with armed probe, etc., generally fail to check the secretion.

There are also some crypts in the navicular fossa, from which oozes muco-pus, that are difficult to cure. I have succeeded in these obstinate cases by distending the last inch of the urethra with a ten-grain nitrate silver solution, injecting it forcibly into that part of the canal while a ligature is placed behind it.

In chronic urethritis, several of these forms, generally most of them, are always to be seen, more or less developed. Farther down the canal the inflammation may extend along the ducts into the glands of Cowper, and farther still, by the ducts which open into the prostatic portion of the urethra into the glandular structure of the prostate, or even into the

parenchyma. It is true that these affections can hardly be called forms of urethritis, though they are produced by simple extension of inflammation from the urethra.

As the intensity of the inflammation subsides, so does the swelling and toughness of the mucous membrane disappear, leaving some parts in their natural condition; while in others inflammation continues and elaborates results which more or less impede the function of the canal. In the same urethra, at different parts of it, there may be—

(1) Superficial granular thickening of the mucous membrane.

(2) Inflammation of the glands and lacunæ.

(3) Areas of induration, which mucous tissue will be converted into fibrous tissue if the inflammation continues some months.

(4) Patches of fibrous tissue penetrating beyond the mucous tissue.

The readiness with which the different forms of chronic urethritis relapse makes the presence together of the simple and advanced changes not uncommon. In simple mucous catarrh the surface is swollen, uniformly bright red, of little lustre, owing to the arrest of secretion of mucus being changed to that of pus; here and there little flecks of yellow matter stick to it, or protrude from the mouths of the glands. The swelling of the mucous membrane makes the lumen appear circular or oval, instead of linear, when watched through the retiring tube (see figs. 2 and 3). The epithelium is readily chafed from the surface, and the passage of the tube or the touch of the mop often causes slight bleeding. This can be quenched by touching the surface with mops of salicylic wool or wool steeped in hazeline.

As the acute inflammation settles into the chronic form the general carmine hue becomes patchy, intervals of slaty red or reddish grey intervene; but this change of colour allows the further alterations of structure to be more easily recognised.

In the next degree of inflammation beyond simple catarrh, the epithelium is lost from small areas, forming shallow erosions, around the margins of which infiltration of the subjacent tissue often gives a greyish border to the erosion. The surface of these erosions is mostly bright red and granular, but sometimes yellow, because they are covered by a closely adherent layer of necrosed tissue and muco-pus (see fig. 4). In further development the minute granulations may grow into prominent ridges, which are

easily recognised as they spring out behind the retreating tube. Sometimes these ridges run longitudinally in the urethra; much more often obliquely or transversely (see figs 5, 6, 9, and 10). They are as frequent in the roof and sides as in the floor. As they heal they generally shrink down, and leave a palish grey streak of fibrous tissue to mark their previous outcrop. Less often, instead of simply healing, they become organised into cicatricial bands or cords of fibrous tissue across the lumen, which, when fully matured, constitute the bridle stricture. In these ways streaks or bands may be produced of some length, but of very shallow depth, so that the urethra where they are situate loses little of its expanding power.

The scars left by the erosion are not always prominent. In some cases the surface heals into a little depression or pit, under which by further change induration has invaded the deeper parts, and caused a thick unyielding area in the urethral wall.

Notwithstanding that some of these terminations are usually permanent, they are not always so, and after a time the places where the shallow indurations and unyielding patches had formed regain their natural rosy tint and suppleness. Even in those cases where recovery has not been complete the superficial indurations do not always increase, and, except when forming bridle strictures, apparently offer no material impediment to the passage of the urine or of a sound. Nevertheless, these sites of by-gone inflammation are more prone to undergo serious change if fresh infection occur than are parts that have regained their healthy elasticity.

When the mucous catarrh has died away the surface is often left paler than before the inflammation began, or with a ground colour of pale pink, or bluish pink with brown pigmentation, either in patches, or for a short distance involving the circumference of the urethra. This makes the margins of the lumen, where the surface is seen somewhat in perspective, much more brown than the rest of the exposed surface (see figs. 15, 16, and 17). Sometimes the brown pigment is found only about the orifices of Morgagni's lacunæ. In addition to the general pallor and patchy pigmentation, not infrequently blood-vessels are seen coursing over the surface in an indefinite manner. They disappear after a brief course, and farther on others become apparent. Except over the prostate, where the vessels are sometimes large and varicose, I have not seen blood-vessels in the healthy urethra.

The change next most frequently observed is inflammation of the glands of Littrè and lacunæ Morgagni.

The changes which take place about the openings of the ducts and lacunæ render their appearances very various. In a newly inflamed urethra the mucous membrane is uniformly red and swollen, and the situation of the lacunæ, being closed by the red swelling, is not distinguished by the red dots. As the general congestion subsides the full carmine colour remains around the orifices of the ducts (see fig. 3), and they are thus distinguished in irregular groups. In some cases the sub-mucous infiltration shrinks early, so that the mucous membrane grows pale white around the dots, or even yellow (see fig. 12). At times it is suffused with brown, and then the brown and white areas about the still red dots give a very remarkable many-coloured appearance to such a group. Ultimately the cup-like hollow is filled up or drawn together, and the brown pigmentation goes. The mouths often gape, so as to make much wider orifices than in the inflamed state, being cup-like, greyish brown in hue, and often have yellow pus lying in the floor of the hollow or projecting above the surface. When fibrous infiltration is complete it is no longer possible to detect the situation or to speak of the ultimate condition of these ducts. Probably, as their sites often become completely firm and grey in colour, they are destroyed or lost in the process of transformation into fibrous tissue of the mucous membrane in which they are situated.

Occasionally, yellowish isolated and lightly raised projections occur in the neighbourhood of these groups of dots. They are sometimes left permanently, but usually they disappear in time; I believe they are inflamed mucous glands, of which the outlets have become closed. Probably formed in them are the small sub-mucous abscesses which occasionally increase to purulent collections, large enough to attract attention by their bulk, and which will be described afterwards.

The deep infiltration of the mucous membrane and underlying erectile tissues causes changes of more serious character, among which is the conversion of the parts affected into fibrous tissue without ulceration.

These changes may reach considerable development before the superficial congestion and bright colour of the patch undergo much diminution. In time the redness subsides to a purple and greyish lilac hue, slowly becoming grey or yellowish grey. Across

such grey areas sometimes, though not very often, racemose blood-vessels wander as fine crimson sinuous lines.

The surface of these patches is often rough, and the lustre small, possibly owing to the imperfect epithelium which covers them. One leading characteristic of these deeply spreading inflammations is their abrupt limitation. The superficial indurations shade gradually away into the surrounding non-inflamed mucous membrane. The deep ones, on the contrary, are often quite isolated nodules, and before their surfaces have lost the carmine hue are detected by the irregular way in which the lumen wriggles from side to side as the tube passes them (see fig. 11). The instrument is either checked suddenly as it reaches the obstruction or is gripped as it passes over the unyielding area. The indurations spring with a jerk out of the way of the tube, or flop back suddenly into place when the tube is withdrawn from them.

After some months' duration, the surface of the scleroses becomes irregular or ridged. The changes they thus produce upon the shape of the lumen are various and well marked. That which should be a transverse chink is in their neighbourhood usually arched or crescentic, or even grooved, in form; the convexity of the arch is, of course towards the non-indurated part, and, as often happens when thickened patches lie in contiguous parts of the wall of the passage, the lumen may become tripartite or quadripartite, according to the disposition of the nodules which displace the lumen from its proper direction (see figs. 12 and 19).

The deep indurated areas are described by other observers to disappear completely in time, and I think myself that I have seen the same, though I am not so positive about their absorption as I am of the absorption of the superficial sclerosis. While they remain they form true organic strictures of the canal. Though commonly diminishing its expansile power, they are not tough when of no great age, and they split readily to allow a bougie to pass. The split when seen by the endoscope appears as a slightly red line or furrow passing through the grey sclerosis longitudinally, *i.e.*, radiating from the lumen, which gapes to let the instrument go by, and shuts again as it is withdrawn (see fig. 32).

The affections of the membrano-prostatic portions will be described with other prostatic disorders.

Swelling and Abscess of the Urethral Glands.

There is occasionally an obstruction of the urethra which personates, so to speak, stricture, by impeding the passage of a sound, due, not to induration of the elastic wall, but to swelling of one of the muciparous glands through blocking of its exit and collection of its secretion, or by pus formed in inflammation of its structure. Such a condition lasts a variable time, but is not permanent. Before evacuation has taken place the swelling is not easily distinguished. The mucous membrane is a little red over the abscess; sometimes in the red area is a yellowish spot with a carmine dot as a centre. After evacuation it is easily detected by the endoscope as a somewhat ragged orifice or gap in the wall. Such an obstruction is often readily felt by its prominence externally as a painful nodule in the corpus spongiosum. Some of these local abscesses extend outwards, and point under the sheath of the penis. When that is so the touch of a knife gives exit to the pus, and the difficulty in micturition or in the passage of a sound vanishes, and the little wound heals quickly. This complication disappears also when the abscess bursts internally, but then a sinus or small fistula is left, into which a drop of urine often penetrates and keeps up inflammation and fresh accumulation of matter. This forms one variety of the peri-urethral abscess, of which the most common site is the last half-inch of the urethra, and the most common bursting-place the furrow near the frænum preputii.

Cowper's glands occasionally become inflamed by extension of the urethritis along their ducts. It is rare affection, or is often overlooked. I cannot remember to have seen many cases. The signs are very similar to those of a perinæal abscess, except that the swelling is formed away from the mesial line, just behind the bulb close to the crus penis. It is very tender, circumscribed, and slow to point. It disappears usually by exit through the urethra of an unusually abundant discharge of matter for one or two days. Some observers state that the pus may be seen exuding from the orifices of the ducts into the urethra. I have not seen this myself. Like ordinary peri-urethral abscess, it occasionally points beneath the surface or wanders deeply in the cellular tissue and accumulates one or two drachms of matter before fluctuation is evident. In all cases of peri-urethral swelling early puncture gives relief, and is seldom in my experience followed by fistula, a condition not infrequent if the abscess bursts spontaneously.

How such abscesses kindle is uncertain, whether solely by extension of the inflammation of the urethral mucous membrane along the wall of the duct of the gland affected, or by migration of the diplococcus or gonococcus in the substance of the mucous membrane which has been suggested by some, is uncertain. Since in acute gonorrhœa the gonococcus has been proved to penetrate into the corpus spongiosum of the glans penis and elsewhere, exciting acute congestion, there is no theoretical difficulty in attributing to it the power of reaching in a similar way the tissue of the glands of the urethra, simple or racemose.

Acute Prostatitis and Epididymitis.

A consequence of chronic urethritis that must not be lost sight of is the possibility of acute prostatic inflammation being excited by it. Such cases are not infrequent. A man whose urethra is beset about the bulbous portion with red inflamed patches may suddenly, without any external cause to excite it, be laid up with acute prostatitis. In such cases the chronic inflammation has extended backwards, in an acute form, to the neighbouring prostatic urethra, and thence into the interior of the organ.

Epididymitis is a complication that is liable to arise when some granular condition exists behind an indurated area that limits the expansibility of the urethra. The mode of origin of this form of epididymitis is not obvious. As the affection resembles ordinary gonorrhœal epididymitis, it is fair to suppose that it arises in a similar way, viz., by progress of the mucous catarrh along the vas deferens from the prostatic surface. The obvious treatment is to widen the canal at the strictured part, and cure the granular condition behind the stricture.

Symptoms of Chronic Urethritis.

In most cases the patient complains of little more than of a very scanty whitish discharge, that has resisted long and varied treatment. Sometimes the patient may add that if he drinks a few glasses of wine or beer or takes some unusual exercise, often without any such cause, the drop of sticky discharge which he sees on rising in the morning becomes purulent, and continues to ooze out the whole day long. It may even happen that if the use of astringent injections be discontinued the flow of pus

becomes copious and scalding pain is felt during micturition. Such a condition may have continued for many months, or even years, now dying away, now rekindling into a plentiful discharge. The abiding condition in these cases is generally a few patches of granulation in the bulbous or membrano-prostatic portions of the urethra, with usually induration there also.

Duration of Contagion.

In considering the various conditions of the urethra of which the presence is denoted by gleet the question arises of the duration of contagion. This in most cases is difficult to answer, and in many cases impossible to do so absolutely. As a means of deciding the question, it has been concluded that when the gonococcus can be no longer detected in the discharge it is justifiable to advise that the secretion is bereft of contagious power. This faith in the peculiar essential cause of gonorrhœa may be justified, but in the present uncertain state of our knowledge of the precise influence of gonococcus as a factor of gonorrhœa it is rash to assume that in the absence of gonococcus from any particular drop of discharge the danger of contagion is past. I am sorry that I can offer for your consideration no definite rule for deciding this question, but I am inclined to think that when the discharge is secreted entirely from granular patches, the crypts and ducts of glands having ceased to furnish pus, we may consider the discharge to be no longer specific in character or capable of communicating disease to others. I base this opinion on the fact that these granular patches have no dissimilarity from granular patches on the pharyngeal or other mucous membranes, which, being simply products of chronic inflammation, therefore probably secrete only a harmless non-specific pus. But when it is recollected how numerous and varied are the various channels along which acute gonorrhœal inflammation may pass, the many ducts and crypts into which it may penetrate, we must be prepared to admit that the duration of the contagious power of the urethral discharge after acute gonorrhœa is unlimited, and to forbid sexual commerce until the gleet is quite cured. The gynæcologist has made out a formidable list of affections that attack newly married women whose husbands are suffering from slight urethral discharge. The discharge of ancient date, and causing no inconvenience to the patient, has ceased to attract attention until the unfortunate

wife is afflicted by some serious illness of an undoubtedly gonorrhœal character.

The changes of the urethra commonly seen in such cases are now to be described.

It often happens that the circumference of the meatus urinarius is exceptionally small, say 18 to 20 mm., instead of 25 mm., the common size; so that testing by the ordinary bullet sound is not possible. Still more frequently the entry of the sound or inspecting tube is checked by a thin membranous band about one-fourth of an inch within the meatus, the remnant of a bunch of granulations formed in the earlier stages of the urethritis. In such cases the urethrameter may be passed down to the bulbous portion of the urethra, and then expanded to 28 or 30 mm., or so long as the patient feels no pain. If the meter is then withdrawn the situation of sclerosed areas can be defined. The instrument can generally be drawn outwards for some distance without much pain; the patient may complain of smarting here and there, and at such places resistance is felt to the extraction of the meter as the instrument travels forwards. A very common place for such a cling is about 3 inches from the outlet, and the instrument must be diminished in size before it will again pass easily outwards. The amount of diminution varies greatly and depends on the density of the induration that has taken place in the walls of the urethra.

If the meatus be not too small, or, if after cocaining, it be cut with the touch of a knife, an endoscopic tube of a size able to pass the deeper obstruction already measured by the meter may be introduced to the bulb, and more precise knowledge of the state of the penile portion of the urethra obtained. It is not well to pass the inspecting tube through the triangular ligament until the passage is familiar with the curved sound. As the tube is slowly withdrawn the following are the conditions commonly descried:—

It must be borne in mind that urethritis begins just inside the meatus, often in the navicular fossa, and travels backwards, dying away as it moves on.

Therefore, in examining a case of chronic inflammation the deeper portions will show more active disease than the anterior part, which, indeed, has often quite recovered the aspect of health.

At the bulb the mucous membrane is often dull cherry-red, without lustre. The lumen is transversely oval, often with a little bead of pus in its centre. Shaggy elevations or little dots of purple tint are set in rows or scattered irregularly over the surface. Presently the crimson

blush is lost somewhat abruptly, and the colour of the membrane becomes light purple or rosy; the shaggy granulations may have disappeared, but the groups of little red dots remain (see fig. 7).

When the part is reached which gave resistance to the outward passage of the meter the colour changes again; it is paler, varying between pale purple and grey. At this part the wall of the urethra flops up behind the retreating instrument, instead of closing evenly after the tube. Near the pale area generally dark ones are placed (see figs. 9 and 10). This dark tint is caused by the growth of granulations on their surfaces. The lumen also, at this place, instead of being transverse, is pushed aside by the unyielding thickening until it becomes irregular or crescentic (see figs. 11 and 12), and over the hardened part sometimes slightly ridged and grooved by the unevenness of its surface. should more than one such thickening occur at the same place the lumen assumes more irregular forms, being pushed in various directions by the projections of these indurations. This obstruction being passed, the mucous membrane assumes a reddish slate or rosy colour, the red dots become few or disappear altogether, the two longitudinal folds of the floor are again discernible, the lumen becomes flat and transversely linear until the last half-inch or so is reached, when it changes first into an oval, then into a vertically linear form. Sometimes a little cling is felt as the tube enters or leaves the urethra, and a small greyish ridge or bridle may be observed crossing the passage.

There are many variations from this common form. If the induration has invaded a long tract of the canal, over such tracts the mucous membrane is irregular in contraction and greyish in hue, or there may be alternating red patches of chronic inflammation and grey patches of contraction. These variations follow each other in quick succession, so that in the same urethra there may be perhaps a dozen different patches--some old, grey, and shrunken; some dull red, but unyielding; some covered by granulations; in some, where the infiltration has not taken place or has been absorbed, the tissue is again yielding and resilient.

The tenacity of the muco-pus secreted on the inflamed patches is an important impediment to the treatment of these patches. It is so adherent that the flow of urine is often insufficient to wash the secretion away. Similarly, ordinary injections may fail to penetrate through the covering layer. If inspection of the canal be made after either or both of these washing processes

have been put in operation, the shred or cap of muco-pus is often seen still adherent to the inflamed surface. Also if a tightly fitting tapering bougie be passed through the urethra the muco-pus will be found adhering to the narrower part of it when the instrument is withdrawn. If inspection be then made the surface is found to be red, and perhaps bleeding from its excoriated surface. A mopping with nitrate of silver of these red patches causes very marked shrinkage. The urethra is swept still better by a bullet bougie, or by a straight stem of which the bullet head has been grooved. This grooved head is rotated on its long axis as it is withdrawn.

Hollows from ulceration, or from the rupture of closed follicles, are rare, and moreover difficult to detect when present. The orifice of a tight stricture, also, sometimes requires careful search. It usually lies eccentrically (see fig. 25), sometimes on one side, sometimes on the other, sometimes in the roof, sometimes in the floor, and hence slips behind the edge of the tube. When it is brought into view its appearance is usually that of an ordinary irregular scar, with a little chink or gap at one part.

LECTURE II.

Treatment of Chronic Urethritis.

For comparing the effects of treatment of chronic urethritis in its varied forms my friend Mr. Campbell Williams has collected and analysed a number of cases from my case-books; these I intend to use as the bases for estimating the effect of different modes of treatment.

In each of one hundred and ten cases of chronic urethritis one at least of the four following conditions was present:—

(*a*) Abnormally small meatus.

(*b*) Stricture, single or multiple, slight or tight.

(*c*) Patches of inflammation.

(*d*) Granular areas.

Though other conditions, such as chronic prostatitis or a small fistula, will produce a gleet, in the vast majority of cases of chronic discharge some part of the penile portion of the urethra is affected by one or all of the conditions just enumerated.

(*a*) Abnormal smallness of the meatus is occasionally the sole cause of the continuance of a gleet, and its free division is followed by complete disappearance of the discharge. Interesting cases occasionally show the influence which a small meatus may have in keeping up irritation sufficient to prevent granular patches from healing after the first cause, gonorrhœal infection, has worn itself out. Among the effects most often described are tingling or itching of the meatus, or sealing of the orifice by the scanty milky white discharge which dries as it escapes. More rare effects are scalding, frequent micturition, and even spasmodic retention of urine. Not infrequently the narrowness of the meatus leads to the belief that real organic stricture is present at the bulbous portion, because irritation originating at the meatus excites spasmodic contraction at the perinæum, which to the unpractised hand suggests stricture. In such cases free meatotomy dispels at once the irritation, difficult micturition, and hindrance to the passage of a large sound. The gleet also disappears, though gradually.

Also where the contracted meatus is only one factor to be dealt with, its free incision materially aids the treatment of the other sources of discharge.

(*b*) Stricture is by far the commonest cause of gleet; that is, if the term is used to include all cases where the natural distensibility of the urethra is lessened, even though in many cases to a small amount. In all the 110 cases loss of dilatability was present. Thirty-five of them had a single stricture, seventy-five more than one. These strictures were most numerous between the third and fourth inch from the meatus urinarius, next most frequently in the first 1½ inch. The common opinion that strictures are most frequently formed at or near the bulb is true only in that long dense strictures are more often developed there. In the above list of cases the induration was present only eleven times between the fourth inch and the sixth inch. Chronic inflammatory indurations appear to be more prone to penetrate deeply into the mucous and submucous tissue at the bulb than elsewhere; possibly this accounts for the production of a larger amount of contracting new growth at this portion of the canal.

A moment's reference to the changes which may be produced in chronic urethritis shows that stricture is not a necessary condition of gleet. Affections which do not cause loss of expansibility will, nevertheless, keep up a muco-purulent discharge. In one patient the urethra allowed No. 27 French bougie to pass easily, though gleet had been continuous for twenty-five months. On the other hand, a few weeks are a sufficient time for the development of considerable obstruction to dilatation. In three months after the first outset of gonorrhœa indurated areas will form, which must be split to allow a full-sized bougie to pass them.

(*c*) Patches of inflammation left after subsidence of acute congestion are usually multiple, commonly two or three, sometimes more, and but rarely a single one is present.

(*d*) The inflamed patches assume a granular condition in some cases, and then the little bosses are easily noted. They bleed readily, and unless a strong astringent lotion is applied, the hæmorrhage is sufficient to wash away or neutralise the effect of the application. This is a point worth recollecting when prescribing injections.

In ninety cases of chronic urethritis the average duration of treatment before cure was obtained was ascertained to be two

and a half months. But in this category was included treatm ent by many different ways.

To consider the effect of the remedies used in cases of chronic urethritis, it will be necessary to consider them in detail. Some were novelties of which it was desired to test the value. Others were remedies in established use, and generally known to be more or less effective.

Soluble Bougies,

containing various drugs in amalgamation, have been of late years vaunted by pharmacists and recommended for various reasons by surgeons. Fifty patients had soluble bougies as part or the whole of their treatment. The average number of bougies used was twelve per patient, but in one case forty-eight were employed. In ten a cure was affected, and the ten cases were thus grouped: to rhatany, one; to krameria, one; to sulphate of zinc and belladonna, one; to chloride of zinc and belladonnae four; to chloride of zinc alone, three.

Thallin, one of the carbol series of derivatives from coal distillation, was used, both with and without cocaine, in Christy's bougies, formed on a spiral wire with a key-ring at one end. They were tried in nine patients, with the following result: None were cured, four were made worse, one was slightly benefited, and four were not improved. Five cases were patients of the Male Lock Hospital, some treated in bed, some as out-patients, and the trials were most carefully made by Mr. John Lynes, of Argyle Road, at that time house surgeon to the Male Lock Hospital. The others were private patients. In one instance a five per cent. thallin bougie set up severe irritation and pain The swelling of the urethra was so great that it caused retention of urine. This condition gradually subsided, and a fortnight later was reproduced by a second trial of the thallin bougie. Iodoform bougies were not used in any of these cases, as years ago I satisfied myself that they are useless in chronic urethritis and a very uncertain remedy in the acute stages; for these reasons I have ceased to employ them at all. In the cases made worse by the use of soluble bougies the discharge was increased in all, in many micturition became painful.

The permanganate of zinc in the form of injection was suggested to me several years ago by Mr. Alder Smith. I have found it so effective and so safe that I have fallen into the habit

of prescribing it in nearly all kinds of urethritis, but not often in chronic cases. Notes of its use in seventy cases were taken; of these, ten were set down as cured by it; in fifty-four it very greatly diminished the inflammation; in four it apparently did no good, and two cases were made worse by its use. Its use is particularly marked by absence of undue irritation. I rely on it more than on any other injection, and I find it to be preferable to the sulphate or sulpho-carbolate of zinc. It requires caution in its administration; one grain in eight ounces of distilled water is the usual strength, though some patients are benefited by increasing the strength to one and a half grains or two grains to eight ounces of distilled water. Beyond this strength I have always found the zinc-permanganate hurtful. Mr. Campbell Williams, who has made investigation on this point, notes that six grains to the ounce is a powerful vesicant to mucous membranes; when applied of this strength to the dried conjunctiva of a rabbit's eye intense injection was immediately set up. Four hours after the application the injection of the conjunctiva was clearly defined into a vesicle surrounded at its base by a red areola with well-marked conjunctival and sclerotic vessels radiating from it, accompanied by considerable purulent discharge. All the symptoms gradually disappeared, and in two days the conjunctiva was again quite healthy. Catarrhal inflammation of the eye was aggravated by solutions much weaker than the escharotic ones. Some vegetable extracts, such as that of belladonna, make with the zinc-permanganate an almost explosive mixture. When prescribed, therefore, the zinc permanganate should be always used alone and dissolved in distilled water, that it be not decomposed before it is used. Ordinary water contains sufficient organic matter to effect its decomposition by attracting its oxygen.

The sulphates of zinc, alumina, copper, and iron. These salts are most efficacious in the later stages of chronic urethritis. They appear to be easily absorbed, and to penetrate fairly into the inflamed tissue. Judging by the appearance of the inflamed patches after the application of these salts, sulphate of zinc used alone makes a thick cake with the muco-pus lying on the patch, and does not penetrate far. Alum also combines with the discharge, but the shreds do not adhere so firmly, and the surface is still red, and apparently not shrunken. Sulphate of copper, on the other hand, is absorbed deeply, but it must be used in very

feeble strength, or it forms an eschar that leaves a permanent contraction. Sulphate of iron is perhaps of no great value; still I think the other three drugs act better when it is present also. My usual practice is to withhold the use of this compound injection until I am satisfied that the urethra is not easily irritated, and then it is generally used by the patient between his visits, to keep up contraction of the inflamed surfaces.

Notes of twenty-five cases treated with the four sulphates were taken. In eight it was the third remedy employed, with four cures and four improvements. Used as the first remedy, it cured twice and improved twice; of the rest, with one exception, it either cured or improved; the excepted one was no better for it.

The strength of the solution is commonly thirty to forty grains of sulphate of zinc, and thirty to forty grains of alum, twenty of sulphate of iron, and two grains of the sulphate of copper, in eight ounces of water. The quantity injected by the patient should be half an ounce, or sufficient to distend the canal thoroughly, so that the astringent may penetrate into the furrows and between the groups and granulations of the mucous membrane. The injection should be retained at least one minute.

Instillations of Nitrate of Silver.

Before these instillations the patient should always empty the bladder, that he may not wash off the injection for some time after it has been applied.

The situation of the inflamed patches having been previously ascertained by passing the bullet bougie or by inspection, a small quantity is dropped on to them by a suitable catheter and syringe, say from 5 to 10 minims, beginning with a solution of 5 or 10 grains to the ounce, and increasing the strength from time to time up to 20 or 25 grains to the ounce. A useful catheter for this purpose is known as Guyon's catheter and syringe. A syringe capable of containing 10 to 20 minims, and marked in minims, is screwed to a flexible catheter stem of 12 millimetres' circumference (about No. 5 English), six inches long, but too short to reach the bladder. The stem terminates in a bulbous nozzle. The stem is marked at inches and half inches by broad and narrow rings respectively. The bulb is perforated in four holes, so that the fluid is ejected on to the part it is desired to attack, while the urethra is distended by the bulb. It is well to have catheters with bulbs of various sizes, to suit different stages of congestion

of the inflamed parts. This instillation is made twice or thrice weekly, according to the amount of reaction it excites. Usually there is some smarting for an hour or two, and on the next two or three occasions of micturition. The next day the gleet is usually increased, the third or fourth day it is less, and often appears to be stopped, but on the fifth or sixth day it reappears, though in less quantity. The injection is repeated until the gleet disappears wholly. Then the patient may relax his regimen and discontinue his medicine. As the patient's condition improves the parts are more tolerant of the injection. If the inspecting tube is used it is often better to apply the astringent by means of a mop, while the effect is watched by the eye. Much stronger solutions, or even the solid caustic, may be used in this way.

In some of the thirty-one cases where nitrate of silver was used a preliminary stretching of the contracted places was made, and the solution was applied through the syringe after the position of the inflamed areas had been discovered by the endoscopic tube. In all cases where this combination was made cure followed more rapidly than when the nitrate was used *per se*. In all these cases the discharge had existed a long time, and many other remedies had been employed by myself or by other surgeons unsuccessfully. The method was twice successful after a single application, eleven times so after two applications, and eight times after three applications. In the remainder the application was repeated several times, in one over ten times, before the discharge ceased.

In several other cases, where a few drops of silver solution were instilled into the urethra by means of a suitable syringe, either by the patient's ordinary medical attendant or by the patient himself, cure was obtained, though sometimes slowly and after many repetitions. When thus applied there were also several failures recorded.

As an ordinary injection, in strength varying from a quarter to one or one and a half grains to the ounce, I have found the nitrate of silver very useless and irritating. In stronger solutions it is generally too irritating to be used in this way.

The nitrate of bismuth often forms an ingredient in injections in combination with chloride of zinc. It appears to have but a restricted value as an astringent in the urethra; in some cases it does good, in others none.

For the value of chloride of zinc as an injection forty-three

cases were analysed. It was rarely prescribed alone, usually in combination with nitrate of bismuth or extract of belladonna, and the average strength was about two and a half grains to the ounce of water. In seventeen of the forty-three cases the discharge ceased after its use; in nine others it diminished the discharge.

Extract of belladonna and extract of opium have been long added by me to injections, with the object of allaying the sensitiveness of the inflamed mucous membrane. Latterly I have almost entirely abandoned their use, holding them to be very inoperative for good or bad effect.

Cocaine in 5 per cent. solution is a better sedative to the inflamed mucous membrane when the pain attending weak astringent injections is severe. But as the cocaine solution requires a preliminary injection, few patients care to be at the trouble of injecting cocaine, and then waiting four or five minutes until anæsthesia is produced.

On the other hand, cocaine is an admirable remedy to prevent the severe scalding pain sometimes attending micturition in acute urethritis. In such cases it acts like a charm if used in 10 per cent. solution, and about one drachm of the solution injected slowly into the urethra and kept there for five or six minutes before the urine is ejected. Cocaine is also valuable in persons in whom the urethra is very sensitive, or, at any rate, who make great outcry of pain if an instrument be passed along the urethra to the bladder. It enables the surgeon to explore the canal, and to discover the cause of the discharge, in such over-sensitive persons. There are usually a relaxed condition of the prostate and chronic inflammation of the ducts.

Certain articles of diet have by tradition an evil repute for causing irritation if taken during chronic urethritis or prostatitis. Asparagus is generally forbidden, and sometimes it does increase the scalding, or produce that symptom when not present. Last asparagus season I noted the effect of asparagus on about twenty patients; that is, I desired A to avoid asparagus, but did not interdict it from B, and so on alternately. From this it appeared that for some persons to eat asparagus is harmless, while in others it is followed by increased congestion and flow of discharge. I have not observed an instance where the irritation caused by asparagus has been very severe. Of alcoholic drinks, of course, being stimulant, all are bad, but champagne, hock, beer, especially Bavarian beer, cognac, whisky, and liqueurs appear to be the

most influential in setting up irritation. Effervescing waters are diuretic to some people; in them lemon squash, etc., are injurious to their urethritis. Coffee, truffles, pickles, and curries have a bad name, and coffee with justice. As to the rest, I am not certain that they deserve it.

A few years ago a drug called "kava-kava" was recommended in the treatment of urethritis. I treated several patients in private and in the University College Hospital, without, as far as I could see, any beneficial result following the exhibition of "kava-kava."

I must not dwell longer in this desultory fashion on the value of drugs which have had either general acceptance or have been recommended as having specific value in the treatment of urethritis. In chronic urethritis of the penile portion I have made my treatment almost entirely local. I have abandoned the use of copaiba, sandal-wood, cubebs, etc., finding them more apt to excite indigestion than to cure the urethritis. In the prostatic portion cubebs certainly, probably sandal-wood, buchu, and copaiba, are valuable adjuncts to local remedies.

By the methods just described good results are often reached, but the number where they fail is not small, and, according to my experience, the most effectual method of treating chronic inflammation is by means of the endoscopic tube. Thorough examination of the urethra having been made, the position of all indurations, granular patches, and the condition of the membrano-prostatic portion noted down, I begin by widening the several indurations; dividing the meatus, if that is too small to admit a bougie large enough to act on the indurations farther down. Especially must the little transverse bands frequently found constricting the urethra about a quarter or half an inch from the meatus be cut through. A scrap of lint is laid in the incision, to prevent the cut edges from joining together again, which they are very apt to do, and three days after the incision a bougie, as large as the urethra beyond the cut meatus, is passed to prevent shrinkage of the cut while it cicatrises. This stretching must be repeated every second or third day for a week or so. The next step is to attack indurations farther down by gradual dilatation, with gradual splitting.

At each sitting, after the bougie has been passed, I insert as large an endoscopic tube as the indurations will let go by, and while inspecting the interior, apply the mop moistened, not drip-

ping, with a solution of nitrate of silver, ten to twenty grains to the ounce, to each swollen or granular area as I detect it. I use the weaker solutions when there is much congestion, and the stronger solutions when congestion has passed away. The old indurated patches require strong solutions to penetrate them.

If, as is often the case, the membrano-prostatic portion is also granular, I finish the sitting by instilling eight or ten minims through Ultzmann's syringe behind the triangular ligament, in the way presently to be described. This ends the sitting, and the patient on the days which intervene between the sittings uses an astringent injection, usually of the four sulphates.

Observation of the effect of remedies on the urethral mucous membrane, and of the passage of bougies through unexpanding parts, has led me to dilate the indurated patches with bougies before touching them with strong astringent solutions, and I think this method superior to any I have previously employed. I found that if the part to be touched with the astringent were not swept clean, so to speak, much of the inflamed surface was in reality not affected by the application. Inspection of the urethra, after the use of an ordinary injection, shows the surface to be dry indeed, but adhering to it are flakes of muco-pus, toughened by the injection or mixed with the bismuth or any insoluble substance that may have formed part of the injection. When these adhering flakes are brushed aside, the inflamed mucous membrane underlying them is red and swollen, while that which has been reached by the astringent is pale and shrunken. Ordinary injections are useful in early general congestion of the surface, but they are very uncertain when the affection consists of hard, unyielding patches. Again; I think that the splitting of indurations is beneficial, by allowing the astringent to penetrate through the fissures to the deeper parts of the mucous membrane, attacking those parts by direct imbibition of the solution.

Inspection of the urethra during treatment helps to explain why soluble bougies so often fail to cure. The bougies being very slender, and very often medicated with substances soluble with difficulty in water, the remedy really does not reach the seat of disease when that lies at the bottom of creases and folds of the mucous membrane.

By watching the mode by which bougies widen tight places one learns to abandon the doctrine of *stretching*, or "gradual dilatation," as it has been termed. The mechanism is the same,

whether the stricture be split little by little by bougies or rapidly rent asunder by a divulsor. There are, nevertheless, two important differences between the gradual and the rapid methods. In the first it is the inelastic new tissue which gives way, and this rent never, so far as my observation goes, passes beyond this comparatively non-vascular tissue; that is to say, so long only as bougies are used which do not surpass in size the natural distensibility. Post-mortem evidence is not wanting to show that rapid divulsion splits sometimes the stricture, sometimes the healthy tissue, and in wounding the latter it often injures the erectile tissue and opens the way for septic absorption.

I have here some drawings of strictures. One (fig. 25) was taken seven weeks after the patient who suffered from it had fallen astride a joist, and ruptured the urethra. Here is another case (fig. 26), in which you will see a small dark red chink passing nearly across the whitened portion. This chink was caused by the successive passages of bougies at several sittings, spread over three or four weeks, in the course of which time a contraction that at the commencement of treatment allowed a bougie of only 7 mm. in circumference to pass had been gradually dilated, *i.e.* split, until a bougie of 23 mm. (No. 13 English) passed through it. My observation of the behaviour of true organic strictures when treated by gradual interrupted dilatation convinces me that the enlargement is always caused by the splitting of the induration. The gradual gentle passage of increasing sizes means the slow production, little by little, of a crack through the stricture. The indurated tissue beneath the mucous membrane is not absorbed during this process; it simply cracks and gaps to let the bougie go past or for the urine to come out. The healthy tissue is unaffected. On recognition of the splitting effect of bougies depends, I believe, the successful treatment of indurated areas by gradual dilatation. In saying this I do not mean that the induration is never absorbed. It does so, but not generally.

Figs. 29, 30, and 31 show the incision after internal urethrotomy through long fibrous strictures. It will be seen in one that the incision intended to be carried vertically through the floor has gone somewhat obliquely along the canal. I may say that in these cases no rise of temperature above the normal range occurred during treatment.

When the acute inflammation has subsided, and only a few

indurations or granular patches are left to secrete discharge, some patients complain of great weakness, and demand "tonics" or port wine, etc., in the expectation that their accustomed energy will be quickly restored to them by stimulants. For such cases iron is generally beneficial, though in most persons the sense of langour soon disappears if left alone. I have supposed it to be of a somewhat sympathetic origin, connected with the previous exaltation of the sensibility of the genital tract.

LECTURE III.

The Prostate.

The prostrate may be affected by chronic inflammation in various ways, on some of which I desire to make a few remarks.

Catarrh of the Membrano-prostatic Portion

not infrequently accompanies chronic gonorrhœal urethritis of the penile portion, and if not also treated while the latter is being cured, the gleet will continue as before. In some patients a trifling prostatic gleet is apt, on small provocation, to become a copious purulent discharge, with other symptoms of an acute kind, if the astringent injection is omitted ; or the rules of diet or other regimen are neglected in such a manner as to cause the secretion of an unusually acid urine. In such cases very acid urine, especially urine containing red sand, will produce acute inflammation of the surface and even of the substance of the prostate, if those parts are already slightly inflamed or congested. This is often seen in gouty people, who have then a form of the so-called "gouty urethritis," much scalding, particularly felt in the perinæum, very irritable bladder, and purulent discharge. This affection differs from the gonorrhœal urethritis, by being more developed in the posterior than in the anterior part of the urethra.

It generally happens in such people that the prostate, examined per rectum, is found swollen and tender ; sometimes it is greatly so, and soft, or soft in one part, firm in another. It is important to recognise the nature of this affection, because if treated by ordinary injections, copaiba, *et id genus omne*, the inflammation is only aggravated, whereas it is quickly subdued by administering salines and colchicum.

Again, states of digestion in which the phosphates are not kept in solution, but appear as a flocculent milky deposit in the urine, will often cause severe aching pain, most felt during and after

micturition, by patients having a granular prostate. In these cases the surface, when viewed by the endoscope, does not appear to be much changed. It is not apparently more swollen during the excessive secretion of phosphates than it was when they were not in excess.

The symptoms of prostatic catarrh are generally insufficient to enable the surgeon to diagnose it, without making careful examination of the urethra.

The act of micturition is often painless in pure chronic prostatic catarrh, not increased in frequency nor altered in force or size of stream. If acute congestion intervenes, the characteristic urgency of the call, the closing spasm, termed by some a "throb of fire," and the drop of pus or blood at the end of micturition are well marked.

The urine is often made turbid by pus-cells floating in it. Of albumen the merest trace is present.

The appearance of the discharge is not worth much. It may be suspected to come from the membrano-prostatic portion if it is only noticed on rising in the morning. In such cases there are always casts of muco-pus in the urine, which are sometimes granular flakes, at others strings, perhaps an inch long. But shreds, very similar to the prostatic ones, are moulded on granular patches of the penile urethra, so that no reliance can be placed on the form of the shreds for localising their source. The delicate filaments not infrequently seen in conjunction with the granular shreds may be secreted in the prostatic ducts, and therefore would be evidence of inflammation more deeply seated than on the surface. Still, put together they do not make much.

By examining the urethra the following conditions, which indicate inflammation of the prostatic surfaces, may be observed :—

If a sound No. 24 or 25 of the millimetric scale be passed no resistance is noticed, and no pain is felt until the prostate is reached, when complaint is made at once. The sensation to the patient is one of heat, ceasing directly the instrument is withdrawn. The passage of the most pliant, well-tapered bougie excites the sense of heat as freely as the metal sound. Some men make great outcry, more from fright than pain, as they generally acknowledge afterwards. Usually no check to the progress of the sound is felt by the surgeon when only the surface is affected, but if the organ is swollen by internal inflammation, obstruction is always felt at the neck of the bladder. After passing a sound or

bougie a drop or two of blood appears sometimes when the patient micturates, but often this evidence of excoriation of the inflamed surface is wanting.

If the endoscopic tube be carried past the triangular ligament, inspection of the prostatic urethra may be made. In most cases it is somewhat painful, owing to the form and position of this part of the urethra, and to the readiness with which the muscles surrounding it contract upon an instrument. But this may be prevented by a previous injection of cocaine.

The changes which take place in the membranous and prostatic portions of the urethra in chronic urethritis are chiefly confined to granular thickening and erosions. Infiltrating and condensing changes of the membrano-prostatic portion, so usual in the penile portion, are far less common here.

The appearances in catarrh of the membranous part are mainly these: the surface generally is of bright red or carmine colour, closely dotted over with more darkly tinted papillæ or granulations. Among these granulations lie slender threads of muco-pus. Here and there bigger tufts of granulations spring from areas denuded of epithelium. They bleed at the least touch of the instrument.

Farther back the surface of the prostate when chronically inflamed assumes an appearance somewhat like that of a very ripe strawberry, being regularly marked with slight elevations and depressions having a colour varying between bright crimson and full scarlet. The little seeds of the strawberry might be represented by small patches of viscid matter, which often cling to the depressions. The shape of the prostatic portion varies considerably. When there is much congestion the surface rises into the rounded form of the strawberry before mentioned. As the congestion subsides the surface sinks till it becomes nearly flat. The surface bleeds readily, consequently an exact appreciation of its aspect is often prevented by small hæmorrhages. Like those in the penile portion, small indurations form in the membranous and prostatic portions; these generally show themselves as whitish or pinkish patches among the crimson granulations. The veru-montanum is a common site of these indurations.

If the prostate be examined per rectum no deviation from health can be detected in respect of size, form, consistence, or sensibility so long as the mucous membrane is almost exclusively affected.

But in many patients the ducts, or ducts and parenchyma, become affected, when changes are made in the natural consistence of the organ.

The treatment of prostatic catarrh consists mainly in local applications, partly in regimen and drugs. When the body of the prostate is not affected, exercise such as walking, rowing, and tennis in moderation is beneficial. Riding on horseback or on cycles is hurtful.

In judging of the amount of exercise desirable, it must not be forgotten that some anxious patients take too little. Because much walking produces aching in the perinæum, they take absolutely none, and thus produce inactivity of the liver and loading of the bowels, which are as bad as the results of walking. Alcohol, coffee, and other stimulants increase the discharge. In languid, feeble persons iron, mineral acids, and quinine are good. So also do mixtures containing cubebs and buchu, and sometimes oil of sandal-wood or copaiba, suit such patients if they can digest these nauseous drugs. Vigorous or plethoric persons do best with simple alkalies and cholagogue purges. The condition of the urine needs attention, that it may be weakly acid or neutral, never highly acid nor alkaline.

It is often necessary to dissipate the mental anxiety with which some patients come to regard the presence of a trifling prostatic discharge. This depression, it is true, more frequently occurs when the organ is inflamed in its ducts, secreting tissue or parenchyma. But in some cases I have been unable to detect any evidence of change beyond mucous catarrh.

Of course it is also understood that any stricture that may have previously existed in the canal in front of the congested prostate has been fully dilated, and is so maintained by suitable means, or the treatment applied to the prostate itself is of little avail. Similarly, indurations in the prostatic portion itself must be dilated.

The most advantageous local remedy is the repeated application of strong astringent solutions to the membrano-prostatic portion, combined with thorough dilatation of the urethra with sounds gradually increasing to 27, 28, or 30 (or in some cases even more) of the French scale. These applications have to be made several times before the granular condition of the mucous membrane is cured. Of the two methods I adopt one is to throw on the surface, every three or four days, 8 to 10 minims of solution of nitrate of

silver, beginning usually with 10 grains to the ounce, or even 5 grains, if there is any reason to suppose the congestion is not quite chronic. Before the injection is made the patient should empty the bladder, that he may not wash away the injection prematurely by micturition immediately after the astringent has been thrown on to the mucous membrane. Ten minutes' delay does very well, though it is better that the patient do not micturate for three or four hours or more, as he will suffer less from soreness than if he does so.

The syringe I use is that of the late Dr. Ultzmann, of Vienna. It consists of a small graduated syringe, holding 10 minims, which can be attached to a metal catheter 6 inches long, and the last inch and three-quarters curved for the quarter of a circle of an inch and three-quarters in diameter. The catheter is long enough to pass the triangular ligament, but not the internal orifice of the urethra. The eye is at the tip of the beak, and thus the astringent is instilled directly on to the membrano-prostatic surface without reaching the bladder.

The pain is seldom much; a sense of warmth or heat, and sometimes desire to micturate, which pass away in half an hour or less, are discomforts usually felt. It is not necessary to keep the patient in-doors on the day of the injection, though I refrain from injecting when the patient has a long railway journey or long ride on horseback before him. The consequences of the injection are a little soreness, sometimes a little bleeding at micturition on two or three occasions, and the gleet or muco-purulent discharge is somewhat increased for twenty-four hours. It then diminishes, but if it does not disappear altogether in two or three days, the time is ripe for a fresh injection. Towards the end of the treatment, when only one or two shreds in the urine represent the discharge, it is well to pass a bougie large enough to distend the urethra and sweep away muco-pus clinging to the granular patches, and thus ensure the absorption of the astringent where it is wanted. The other plan, which is more effective in very obstinate cases, is to apply the astringent directly through the endoscopic tube to the part affected. Before passing the straight tube I accustom the deeper part of the urethra to the presence of large instruments by passing full-sized sounds. This also serves to dilate such constrictions as may be present. Then the inspecting tube is passed No. 24 or 26 being usually selected. It is gently pushed as far as the internal meatus urethræ, and the plug being withdrawn, the

surface is mopped dry. If, as often happens, the edge of the tube in passing through the triangular ligament chafes the granulations to bleeding, a mop, dripping with tincture of hammamelis is freely swabbed over the surface, which is then carefully dried. The tube is slowly withdrawn, and the condition of the urethra as far as the bulb is noted. The tube is slowly pushed in again, and the granular patches mopped with various astringents. Where the surface is pretty evenly congested, a solution of bichloride of mercury of one per cent. in spirit is very effective. It thoroughly whitens the surface it touches, but does not cause pain. Thick granular patches require stronger astringents, such as nitrate of silver in ten or twenty per cent. solution. The mops must be small for these strong solutions, that only small areas may be touched by them. The solid nitrate or the sulphate of copper in crystal may be used for ulcers and very shaggy tufts. In a few days—three or four usually—the irritation of the application has subsided, and the patient is ready for a second application. A considerable diminution of the congestion or shrinking of the granulations is observed to have followed the first application, and in time—usually after four or six such applications—the mucous membrane has acquired its natural purplish pink hue, and the granulations have almost disappeared. A bullet bougie will sweep no muco-pus from the canal, and the urine is bright and clear of the flocculent shreds when voided.

When there are a few indurated patches in the penile portion it is well, before dismissing the patient, to teach him to pass a large bougie (No. 26 or 27, for example), so as to stretch these patches and brush down the remains of any granular ones there may be when injections are discontinued. If the bougie is passed before the patient rises in the morning—twice a week at first, then once a week, and so on at longer intervals for six months—the liability of relapse is diminished, and the cure becomes permanent.

Prostatitis, when the Substance of the Organ is Concerned.

When the inflammation has extended from the urethra along the ducts to the secreting tissue of the organ there are generally present, in addition to the symptoms of granular urethritis already dwelt upon, those of inflammation of the body of the prostate, such as aching or stabbing pain at the anus, sacrum, or perinæum. Pain at the supra-pubic region is commonly a sign even when no

cystitis is present. There are also radiating lumbar or femoral pains after exercise or long journeys, general languor, malaise, or depressed spirits. Increased frequency of micturition is often absent, and particularly wanting are the nocturnal calls to pass urine which so commonly attend senile enlargement of the prostate. The alteration in micturition is rather an impediment at the beginning, a delay in starting the stream, which when most exaggerated amounts to retention. Not uncommonly the sensitive state of the prostate renders the call to micturate, when it is felt, uncontrollable, being an exaggeration of the natural impulse, which physiologists tell us is due to trickling of urine into the prostatic portion. Dull pain after micturition, sometimes spasm at the end of the flow, with a sense of more to come, are generally described. In cases of long standing, where the prostate has become very irritable, micturition during sleep is in some a troublesome symptom. Some persons are awakened by the act; others only discover what has happened when they wake in the morning. Constipation is almost invariable.

When the congestion is great there is also pain during defæcation, and between these acts a sense of weight at the anus or in the perinæum, increased at times to severe pain.

Pain in the testes is seldom an early symptom in prostatitis, nor, so far as my experience goes, does it occur when there is simply superficial catarrh. It comes without any swelling of the cord or epididymis or other sign of inflammation. The testes, and cords too, are often highly sensitive, and the patient flinches when they are touched. The pain is neuralgic and spasmodic, *i.e.*, it comes and goes without obvious cause, except that exercise and much standing bring on an attack. The testicular pain is generally less at night, but not always so. Remedies are of no avail against the pain unless the prostatic condition is made out, and the appropriate treatment for that affection applied.

A constant symptom is hyper-secretion of prostatic mucus, varying greatly in amount from a few drops of colourless glutinous fluid to an almost continuous discharge. In the latter cases, when the prostate is compressed in defæcation or by the finger in the rectum, the mucus oozes from the urethra in a glassy thread, which may dangle down for more than a foot. Usually the mucus is not mixed with semen, unless the vesiculæ seminales are also inflamed. When these symptoms are pronounced the prostate is perceptibly enlarged, but soft and generally tender.

In some patients the organ recovers its natural condition in a few weeks, but usually the disease drags on a course more or less wearisome, always liable to periods of pain and to attending despondency. Thus the duration is nearly always long, and the termination very uncertain. Relapses are almost sure to follow if the patient exceed in diet or exercise, or be exposed to cold while perspiring, and particularly if he indulge in venery. In relapses small abscesses often collect in obstructed ducts. They usually empty their contents through a duct before accumulating much; this appears at the end of micturition as white curdy matter. Chronic vesical catarrh or chronic nephritis may arise during the course of chronic prostatitis.

In some cases, instead of clearing up, the inflammation spreads beyond the ducts to the parenchyma, and the prostate then becomes unyielding to the touch, large, and sensitive. In very obstinate cases, though probably some tuberculous deposit is then present, large abscesses collect, pass beyond the parenchyma, and form peri-prostatic abscesses, breaking into the bladder or the rectum, or causing perinæal or other fistulæ.

The enlargement of the organ may last long after it gives the patient any discomfort and be even permanent. The increase of size may be symmetrical, or only affect one part; then it gives the sensation of irregularity or lobular form to the finger. In course of time the nodules may disappear, and the organ regain its natural size, or even shrink below it, and feel quite firm and smooth when examined. The post-mortem appearance of such a cirrhosed prostate has been likened to the fibroid change that is produced in the lung.

Treatment.

The treatment of chronic prostatitis when the body of the organ is affected is very tedious. Of the many remedies which have been recommended by this or that authority, or form part of stock routine treatment, I have come to trust only a few for effecting a cure.

General treatment only assists the local remedies. In the first place, cure of the dyspepsia, with its frequent concomitants of constipation and phosphatic urine, by appropriate drugs and diet, must be undertaken. To these may be added moderate exercise, abstention from violent exertion, frequent warm needle-baths, massage, shampooing, etc.

In patients whose prostate is irritated or enlarged by chronic inflammation tonics and aperients are valuable. Aperients are beneficial, of course, by emptying the rectum, and also by increasing the secretion of mucus from the intestine, and in these two ways aiding the circulation through the prostatic blood-vessels, which are closely connected with the upper hæmorrhoidal veins.

The tonics most beneficial are iron in non-astringent forms; if given in astringent forms it needs the addition of a laxative to prevent constipation. Nux vomica or strychnine is usually added to the iron. Belladonna also, if micturition during sleep be a symptom, may be added to the tonics. Ergotine is specially useful when the organ is large, and aching is caused by walking or standing about, or by railway journeys. Its *rationale* of action is not clear, but presumptively it causes increased tonicity of the muscular structure, and possibly in that way hinders or lessens passive congestion. It must be continued for three weeks or more to be permanently effectual.

The Local Treatment.

When the organ is enlarged, soft and not tender, or only slightly so; that is, when acuteness of inflammation is quite lost, a very good remedy is the cold sitz bath, taken at first for one or two minutes, once or twice daily, at a temperature of 50° F., gradually prolonged and lowered in temperature till a duration of ten minutes and a temperature of 35° F. are reached. The cold or tepid douche on the perinæum or anus from two to five minutes twice daily is a valuable resource.

Perhaps more generally beneficial than baths are cold enemata, two to four ounces of cold water thrown into the rectum daily, and retained there; beginning at 45° F., gradually lowered in succeeding days to 35°. So low a temperature as 35° F. is not easily borne, and many patients must stop the reduction of temperature at 40°, while continuing the use of the small enema. When the effect of enemata begins to weaken, the cold water may be injected into the bladder, beginning also at 45° F. and very slowly descending to 35° F. The quantity may also be slowly increased from two ounces to six or eight ounces.

Among recognised remedies is blistering the perinæum. It may be applied in two ways. In one a small patch of skin near the raphé, between the bulb and the anus, is blistered over and

over again by a light pencilling with liquor epispasticus. I have tried the plan many times, without once satisfying myself that benefit came from its use. By the other plan a large surface of the pubic and inguinal regions is blistered, and much suffering caused to the patient, without, as far as my experience teaches, any adequate improvement of the ailment. For these reasons counter-irritation is no longer one of the methods of treatment I pursue in chronic prostatitis.

Caustic injections, so valuable in catarrh of the surface, are beneficial in chronic inflammation of the body of the prostate, but I reserve them until other means have failed to do good. They must be stronger than those used in chronic catarrh, though it is seldom necessary to employ a greater strength than twenty to fifty grains of nitrate of silver to the ounce, and not more than ten to twenty minims of the solution should be used at a time. Of course the weaker solutions are first tried. As these solutions are strong, a previous benumbing of the prostatic surface with cocaine, eight to ten minims of the 10 per cent. solution, is needful to render the pain of such an injection bearable. In ten minutes after the silver solution has been thrown in the patient micturates, and thus dilutes and washes away the caustic solution. If the urine be voided and six to eight ounces of tepid water injected into the bladder before the injection, with which the patient may flush his urethra, that is better still. If the burning pain be severe, the patient may sit for fifteen or twenty minutes in a hot hip bath, and use belladonna suppositories. One injection is seldom sufficient; it has to be repeated three, perhaps more times, at intervals of one or two weeks, to effect a cure. If the prostate is inspected in the interval, it is found at first much swollen on its urethral surface, and congested to a dull crimson colour, and more granular than before, with large tough flakes of muco-pus adherent to it. A few days later the surface is found to be much less prominent, of lighter tint, and free of flakes (see figs. 33, 34, and 35), which show the vesical portion of the prostate viewed by the cystoscope in the bladder, not the urethral part of the prostate on which the injection is directly made. When the urethral portion is viewed by the endoscope, the surface is less turgid, paler in tint, and the utricle in the verumontanum is narrower than before. The prostate examined per rectum is also less tender, smaller and firmer than before. The subjective symptoms are less also.

The passage of large bougies or steel sounds may be usefully employed after the soreness of the surface, caused by injection, has subsided. If beneficial, they contribute a sense of lightness and ease to the patient, often felt the moment the sound is withdrawn, and certainly in the course of the same day. On the other hand, if the passage of the sound causes sense of weight or soreness it has been prematurely used, and will do harm instead of good.

Epididymitis is very common in the course of chronic prostatitis, coming at any time during the prostatic catarrh or prostatitis, for it attends both affections. In this irregularity of occurrence it varies from ordinary gonorrhœal epididymitis, which generally chooses the fourth week after contagion for its appearance. I do not know any other distinction between the epididymitis occurring in acute gonorrhœa and that appearing in the course of prostatitis. Sometimes both epididymes are attacked successively. If the patient be favourable for the development of tuberculous disease I think tuberculous epididymitis is more likely to take place during chronic prostatitis than after acute gonorrhœal epididymitis.

Masturbation is a frequent provocative of prostatitis, sometimes in the acute form, more often in the sub-acute or chronic forms. In such cases the organ is kept in a congested state, and by its consequent irritability reacts on the nervous condition of the patient, producing much anxiety, as well as bodily discomfort. Among the consequences of the irritation are painful seminal emissions, which are frequent in chronic congestion of the organ, and are repeated till the congestion is removed.

In the mildest form of prostatitis through masturbation the prostate is congested, and bleeds easily; then the urine is tinged with blood, smoky, or even coffee-coloured. Micturition is frequent, and causes smarting at the neck of the bladder, and sometimes a few drops of blood escape at the end of the flow of urine. If felt per rectum, the organ is found very little changed from its natural condition; perhaps tender, rarely swollen. General malaise, inappetence, and slight elevation of temperature usually accompany the symptoms. As the patient is generally unaware that his habit causes the mischief, the bleeding, pain, and febrile disturbance occur from time to time, unless the lad is warned and broken of his habit.

Bleeding from the prostate, when it is congested, may be very copious, both in old and young. In young men it follows pro-

longed venereal excitement and excessive copulation. Commonly very copious when thus originated, it even may be profuse for an hour or two, and if continued for twenty-four to thirty-six hours it may greatly exhaust the patient. I have not known a fatal case. When the hæmorrhage ceases the ordinary symptoms of chronic prostatitis remain.

In elderly men who have senile hypertrophy and varicose veins congestion often sets in after a good dinner, followed by a chill on going home, this possibly followed by coitus; such congestion may be the cause of bleeding, retention, and fatal inflammation.

When masturbation or other erotic excitement has preceded or keeps up the prostatic congestion, besides insisting on the bad habit being abandoned, the administration of the liquid extract of salix nigra, a drachm three times daily, has often a marked effect in checking involuntary emissions, and thereby preventing the irritation, and exhaustion, and neuralgia which in such persons follow these attacks. By salix nigra so much relief can be given as to enable the patient to exert the self-control which is indispensable for complete cure, and to persevere in the other remedies necessary in treating chronic prostatitis. Bromides do not affect the frequency of the emissions, and have the mischievous influence of depressing the patient; hence I rarely prescribe them.

Patients who have suffered from a congested prostate are liable to a disability which often gives them serious apprehensions when contemplating marriage; viz., too speedy ejaculation during copulation. In some the ejaculation is so rapid, and erection so fugitive, that effective coitus is impossible. In mild cases this incapacity commonly so far spontaneously diminishes that it ceases to give the patient distress. In severe cases, when disability is more than mere nervousness, or when erection is hardly produced at all, the tincture of damiana has sometimes a powerful effect. Yet I think its good influence is sometimes more due to faith than to any other effect it has over the nervous system. Still, I have seen it useful in a sufficient number of cases to induce me to employ it when the disability is serious.

Cure is almost hopeless if continence is neglected and the morbid craving for coitus is gratified. Some persons give way to this appetite without limit, and produce a disastrous condition, one of great helplessness and most difficult to alleviate, which induces them to undergo any treatment that unscrupulous quacks may advise. In the condition I mean, though no paralysis be

present, the intense neuralgia of the lower extremities which follows the slightest bodily exertion renders all exercise impossible. Even when at rest pain is rarely absent; starting from the sacrum, it extends along the spinal column to the occiput, there producing a dull pain, severe enough to prevent the patient from occupying himself in any intellectual pursuit. The lower extremities and perinæum are attacked by sharp shooting pains, simulating the "lightning pains" of locomotor ataxy; these pains rarely extend to the testes. The digestion is not infrequently deteriorated, and to the neuralgia are added the sufferings of dyspepsia. The mental condition is more pitiable still. The sufferers are usually men of highly nervous disposition, and often of great intellectual power; hence they feel most keenly their inability to follow their usual occupations, whether of labour or of amusement. Topical treatment after the mucous catarrh and chronic inflammation of the prostate is quelled must be laid aside. That universally applied remedy massage, or rather rubbing, is sometimes useful, but complete cure must not be expected from rubbing and kneading alone. The best remedy is a life of quiet, absence of exertion, or at any rate of bodily exertion. Probably a long sea voyage in a sailing ship where ladies' society is wanting is one of the best remedies, particularly if the patient has sufficiently recovered on the voyage to be able to travel by land; then he may make an excursion to a colonial sheep or cattle station, and so gradually regain his power for physical exercise; and as this returns so does the mental equipoise come back also. One most severely afflicted patient gained complete recovery by working for two years on a New Zealand sheep farm, where he commenced as cook to the shepherds, and gradually regained sufficient strength to undertake the fatigue of shepherding. For persons unwilling to submit to so severe a *régime* the various baths of Europe may be advantageously visited, though there is risk that some foreign enthusiast in the medicinal worth of this or that system of bathing may persuade the patient to go through exhausting courses of baths, with the promise of thorough cure. Every failure of this kind throws the patient back into his despondency. For this reason I prefer a sea voyage in a ship where the only doctor is the captain, whose treatment is not likely to be over-complicated.

In rare cases chronic parenchymatous prostatitis will excite that form of mania which has erotic irritation for an early or leading symptom, in both middle-aged and old men. There are

other conditions which maintain irritation of the prostate, that produce it more frequently if the prostate be hypertrophied within, as well as irritated from without. Among these conditions are stone, tubercle, or tumour. It is, I think, always a temporary form of mania, and if the patients recover from the physical affection, the mental faculties are restored to them.

Tubercle of the Prostate.

Tuberculous disease in the genital organs so frequently follows gonorrhœa, and at no long interval, that I have come to consider gonorrhœa to be indirectly an exciting cause of tubercle. Marked instances develop during the course of prostatitis, and I desire to occupy your attention with some remarks on the tuberculous affections of that body.

The early stages of this affection are very insidious, and are not looked for, because the symptoms—chronic gleet and perhaps weight in the perinæum—do not attract attention to the prostate itself, but are believed to be simply indicative of the chronic catarrh that had preceded and set in motion the tuberculous disease. Indeed, so far as my experience goes, the development of tubercle in the prostate has become considerable before its signs are perceptible by the finger.

Such a case as the following is a good example of the early symptoms of tuberculous prostate. The patient, nineteen years old, complained of pain felt in micturition both before and during the flow of urine. This pain was always increased by walking. There was blood at the end of micturition. If he jumped he had a stabbing pain in the perinæum. The sound discovered nothing in the bladder, though its entry thither was painful. The testes and cords were normal. The finger in the rectum found that organ to be firm, its lobes slightly nodular and slightly tender. The further progress of the case had the ordinary tuberculous character. In reading this description one is struck by the many points of resemblance to the symptoms of stone in the bladder, on the differential diagnosis of which affection I shall touch later.

Yet another characteristic case from the case-books of University College Hospital. The patient, aged twenty-four, was married, and had never had gonorrhœa. He had suffered for several months, more than twelve, from smart pain after micturition, lasting five minutes. He had been sounded twice for stone, in a pro-

vincial hospital. Blood had been passed with the urine before he had been sounded. His pain was on admission continuous, and felt all along the urethra, but worse after micturition. The frequency of micturition reached from twelve to twenty times a day, if he walked much. If he lay in bed it lessened to five or six. The examination per rectum discovered a soft swelling in the prostate. This case ended with the ordinary one of tuberculous prostatic abscess, pyelo-nephritis, and death.

It is not always that the patient presents such definite symptoms at first. Usually in the early stage they are those of prostatic catarrh; that is, a history of previous gonorrhœa, never completely cured, always continued as a drop of milky fluid at the meatus, on rising in the morning.

Such a condition lasts an indefinite time; eventually attention is directed to the prostate by the occurrence of frequent seminal emissions, or by weight in the perinæum and pain in the sacrum, with more or less loss of strength. In other cases the patient notices a slowness in starting the stream of urine. Then he feels burning or cutting pain when passing water, and some aching and sense of more to come at the end of micturition. Micturition is frequent by day, more so than at night, especially if the patient moves about much; ultimately there is little distinction between night and day. These signs may be absent or overlooked, and no suspicion is entertained of the changes taking place in the prostate until softening of the deposit, with ulceration of the surface, sets in, when the signs become marked indeed.

As soon as alteration in shape and consistence have taken place in the prostate the finger in the rectum finds the prostate irregular in form, perhaps larger than natural, tender, and particularly tender at the posterior part, where the trigone of the bladder begins. The disposition of these irregular thickenings is very variable. Most commonly they are detected in one or two lobes. Not always so; there may be tender swelling, detected only in the anterior portion of the side of the prostate, reaching forwards towards he crus penis. In other cases the thickening extends backwards from one lobe to the vesicula of that side. Again, the nodule may form as a hard yet tender mass in the centre, while the rest of the organ remains soft and insensitive.

There is difficulty in beginning the stream of urine, the first drops of which contain some shreddy pus or some dark coagula; a few drops of blood may end the evacuation. During the whole

flow of urine scalding is more or less severe, and the urine itself is turbid with pus, that settles into a flocculent deposit of considerable amount. To this succeeds sometimes supra-pubic pain ; but not infrequently the pain is referred more to the sacral or sacro-iliac part of the pelvis, not to the loins or pubes, unless nephritis and cystitis be present also. When cystitis is developed copious viscid pus, mixed with shreds and blood-clot, forms the urinary sediment, and the urine contains albumin in considerable quantity. By this time there are sufficient signs to be found to enable an exact diagnosis to be made, and to distinguish it from stone in the bladder, the affection with which it is not uncommonly confounded.

The further progress of the case is gradual participation of the ureters and kidneys in the destructive inflammation caused by septic irritation. The patient suffers more and more pain in the urinary tract, and is gradually exhausted, until septic pyelo-nephritis or acute general tuberculosis terminates his sufferings. Acute tuberculosis unfortunately may set in even when the patient is making, so far as his local ailment is concerned, steady progress to cure. The spontaneous general outbreak of acute tubercle is not specially confined to prostatic disease, being not infrequent in chronic hip disease and other local tuberculous affections. As in the hip cases, it often immediately follows some operative procedure on the tuberculous region, such as scraping, but it also breaks out when the chronically inflamed surfaces have undergone no such local interference. Three patients under my care, when making good way with the prostate and bladder, sank under acute tuberculous meningitis in a few days.

I have not yet been so fortunate as to inspect a case of early disease before signs detectible by the finger in the rectum are present. Hence I cannot say that the mucous surface of the prostate has any distinctive appearance before the shape of the organ has changed. It may be so.

The age of the patients ranges usually between nineteen and forty years. I have notes of a patient who was fifty years of age, though the disease in his case was well advanced before he came under my care, and some years had elapsed between the first indications of trouble at the neck of the bladder and the ulcerative cystitis which sent him into hospital. The patients are ill-nourished, weakly, it may be with history of pulmonary tubercle in their family, though often not presenting in their own persons indications of tuberculous phthisis in the lungs.

I have inspected only one or two cases of advanced disease by the cystoscope, and have unfortunately no drawings of tubercle in the body of the prostate itself taken during life. The surface is irregular, with pits at the uvula vesicæ or neighbouring part of the floor of the bladder, partly filled with shreds of tissue, muco-pus, and blood-clot; in fact, just what is seen often enough post-mortem, though in those cases general cystitis, ulceration, burrowing abscess in the floor and walls of the bladder are usually superadded before death arrests further destruction.

The Treatment of Tuberculous Prostatitis

in the early stages of the disease, before ulceration and cystitis have begun, resolves itself into curing the prostatic catarrh, and in applying the general hygienic and medical treatment suitable to the tuberculous condition. When tubercle has broken down, and produced ragged cavities about the prostate and the floor of the bladder, relief may be given by carefully washing the bladder four times daily to clear out the pus and urine from the exposed parts. I have tried various aseptic solutions with more or less success. That on which I have most reliance has been until lately the two-grain to the ounce solution of sulphate of quinine, two ounces being injected and left in the bladder after the pus and urine have been well cleared out by repeated small injections of boric acid solution. Of late I have been struck by the excellent effect produced by injecting an emulsion of iodoform in cases of chronic cystitis. In twenty-four hours urine previously ammoniacal becomes and remains acid, fœtor is prevented, and the amount of pus rapidly diminishes. In persons whose cystitis has been caused by neglect of prostatic retention the urine in ten days becomes quite free from deposit, even when calculus, or tumour, or malignant ulceration co-exists. The cystitis is kept in abeyance, the patients lose most of the pain they had previously suffered, and the bladder will again retain its contents comfortably for three or four hours.

I have here two drawings made of the floor of the bladder (figs. 36 and 37), viewed by the cystoscope, which show an early tuberculous ulcer of the mucous membrane, before and after healing. The patient, a man of forty-five years of age, with slowly advancing pulmonary tubercle, was seized, shortly before his admission into University College Hospital under my care, with frequent painful micturition and purulent deposit in the urine.

No information was gained by the sound, and the cystoscope was then introduced. There was general rosy tint of the mucous membrane, with granular areas to which flocculi adhered; other flocculi floated in the boracic water with which the bladder was distended and irrigated during examination. At the trigone, after careful search, the little cup-shaped yellow ulcer was seen which is represented in the drawing. The exact resemblance of this sore to tuberculous ulcer of the tongue led me to diagnose it as an early tuberculous ulcer of the bladder, just behind the prostate. The bladder was carefully washed out twice daily with boracic water, and after washing, two drachms of iodoform emulsion were injected and left in the bladder. Very speedy relief followed this treatment. The pain disappeared first, then the patient became able to retain urine for some hours. The pus ceased, and in a fortnight the act of micturition had become quite normal. The second drawing, taken a fortnight later, shows the ulcer in the bladder healed and covered by a scab or replaced by a scar, as you see; I cannot be quite sure which. After a fortnight's further stay in hospital, the patient left, apparently cured of his bladder trouble. Hitherto such good fortune has not attended the treatment of tuberculous prostatitis, but the use of iodoform applied to earlier stages of the disease may probably bring it into the category of curable disorders; but, at any rate, great diminution of suffering may be expected. In some far advanced cases of ulcerated prostate it has assuaged the patients' sufferings and prolonged their lives.

In very bad cases of tuberculous ulceration, where the pain of passing the catheter and injecting is too great to permit of sufficient washing out, the previous injection of a drachm of 5 per cent. solution of cocaine into the bladder will render the operation bearable to most persons. When things are too far gone for this it is best to give ether while the bladder is thoroughly washed out with a large silver catheter with wide eye, and Clover's bottle for extracting calculous *débris*. The interior of the bladder having been thus cleaned and emptied, a drachm of iodoform emulsion is injected and left in. The relief afforded by this thorough clearing out of all decomposing matter is so great that the pain of subsequent washings is much lessened and soon ceases altogether. By the local ease thus given, the general improvement makes rapid advance, and the strength quickly ncreases.

The formula for the emulsion is—

Iodoform, 2 parts.
Mucilage, 4 parts.
Glycerine, 2 parts.
Water, 20 parts.

This emulsion causes no pain in the ulcerated bladder. The iodoform is not absorbed, but evacuated little by little at each micturition. Usually one injection in twenty-four hours suffices.

If much glycerine instead of mucilage be used the emulsion causes smarting pain till the glycerine becomes well diluted with urine.

Perinæal section and constant drainage must be done when the urine cannot be restored to a healthy state by the means just described; but the daily washing is still as necessary as when the patient voided all his urine by the urethra. A patient in University College Hospital some years ago was much improved by perinæal section and drainage. He grew so well and strong that it was hoped that his tuberculous ulcers had cicatrised. Under this anticipation, the perinæal tube was removed and the wound allowed to close twice. But as soon as this was done the irritation of the bladder returned and pus reappeared in the urine. Ultimately the patient left, wearing the tube, for the Highgate Hospital, where a few weeks later he died of acute tuberculous meningitis.

The Differential Diagnosis of Tubercle in the Prostate.

In early cases the presence of tubercle elsewhere may be wanting; for, as the first onset of tubercle may take place in any part of the genito-urinary tract, the prostate may be affected before the disease has made progress in other organs, such as the vesiculæ seminales, the epididymes, and vasa deferentia. When co-existing disease is present the diagnosis of tubercle in the prostate is easy. But this collateral evidence is not always present.

In a case in which a post-mortem was made recently in University College Hospital, the cause of death being tuberculous disease, the kidney, the ureter, and the prostate were the only organs in which tubercle had advanced to destruction. The vesiculæ were sound, and so were the epididymes. In the right vas deferens were some small miliary tubercles, of which the most

recent ones were those nearest to the epididymis. This case is interesting in showing that tubercle, in some cases at any rate, extends towards the epididymis and does not begin there. Probably this is often the case.

The disease most commonly suspected when tubercle is irritating the prostate is stone in the bladder. The age of the patient is alike for both. The early local symptoms are very similar—increased frequency of micturition affected by motion, pain at the end of micturition, and soreness at the neck of the bladder. Pain a little behind the tip of the penis, rather than precisely at the tip, indicates prostate more than stone; but this distinction does not always exist when the prostate is affected.

The urine is at first only moderately turbid in both. In prostatic tubercle there is often a gleet or history of such having continued since an attack of gonorrhœa, and a little shreddy mucus may be washed out in the *first* portion of urine voided, the remainder being only slightly turbid. In cystitis set up by stone, the muco-pus comes mainly at the end of micturition. When blood comes from the prostate it is usually washed out first as coagula mixed with curdy pus. In stone, on the other hand, a drop of blood comes at the *end* of the stream, instead of the pus at the beginning. It is true that when the ulceration is extensive the blood may be great in quantity and mixed with the urine, and the stream end with pure blood. In both affections when this is so, other changes in the bladder and the prostate make the diagnosis of tubercle from calculus easy.

If the patient be sounded, and stone be there, it can generally be detected and all doubts set at rest. Sounding does not always discover any alteration of shape or irregularity in the prostate or trigone, unless the tuberculous disease be far advanced, when, of course, there is no difficulty, and strong presumptive, if not certain evidence may be obtained of the nature of the disease. What may be discovered by cystoscopy my opportunities do not yet allow me to say, though I confidently expect that further research with this instrument will make the recognition of tubercle easy by its aid alone.

When vesical tumour is present the signs are commonly so different from tuberculous disease that confusion is not likely to occur. The age of the patient is generally greater in epithelioma than in tubercle; not always, as tubercle develops in men of fifty or more, when epithelioma is also met with. Papilloma or fibroma have a

distinct history of intermittent hæmorrhage before vesical irritation begins, as well as other signs not necessary to dwell on here.

Malignant disease of the prostate itself is also a disease of riper age than tubercle. It furnishes a much harder and firmer enlargement of the prostate than tubercle. When ulceration has begun there is still difference in the condition of the prostate when felt by the finger. The thickening extends to the trigone, and the sensation of firm infiltration felt between the sound in the bladder and the finger in the rectum is very different from the bossiness of tuberculous enlargement.

The diagnosis is further aided in most cases by the absence of nodular thickening in the vesiculæ, cords, or epididymes.

Pyelo-nephritis, set up by calculus or tubercle, or by malignant disease, may create a series of symptoms, such as purulent urine, frequent micturition, scalding pain at the neck of the bladder, etc., etc., which may mislead when attempt is made to locate the source of the suffering. Yet in these cases the absence of change in the condition of the prostate and the presence of tenderness in the renal regions help out of the difficulty. When the pyelo-nephritis is of tuberculous origin, not uncommonly the prostate is also tuberculous, and then the diagnosis of the accompaniment of kidney disease rests on the abundant creamy pus, the casts in the urine, and other signs of renal disease.

In rectal disease, when the bladder is irritated, a very cursory examination suffices to eliminate the prostate from being the cause of the painful, frequent micturition which is sometimes an attendant on rectal ailments.

Of course to all of these distinguishing signs in most cases can be added the information gained by careful inspection of the interior of the bladder with the cystoscope, while distended and irrigated with boric acid solution.

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