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OGILVIE WILL
ON
GENITO-URINARY DISEASES

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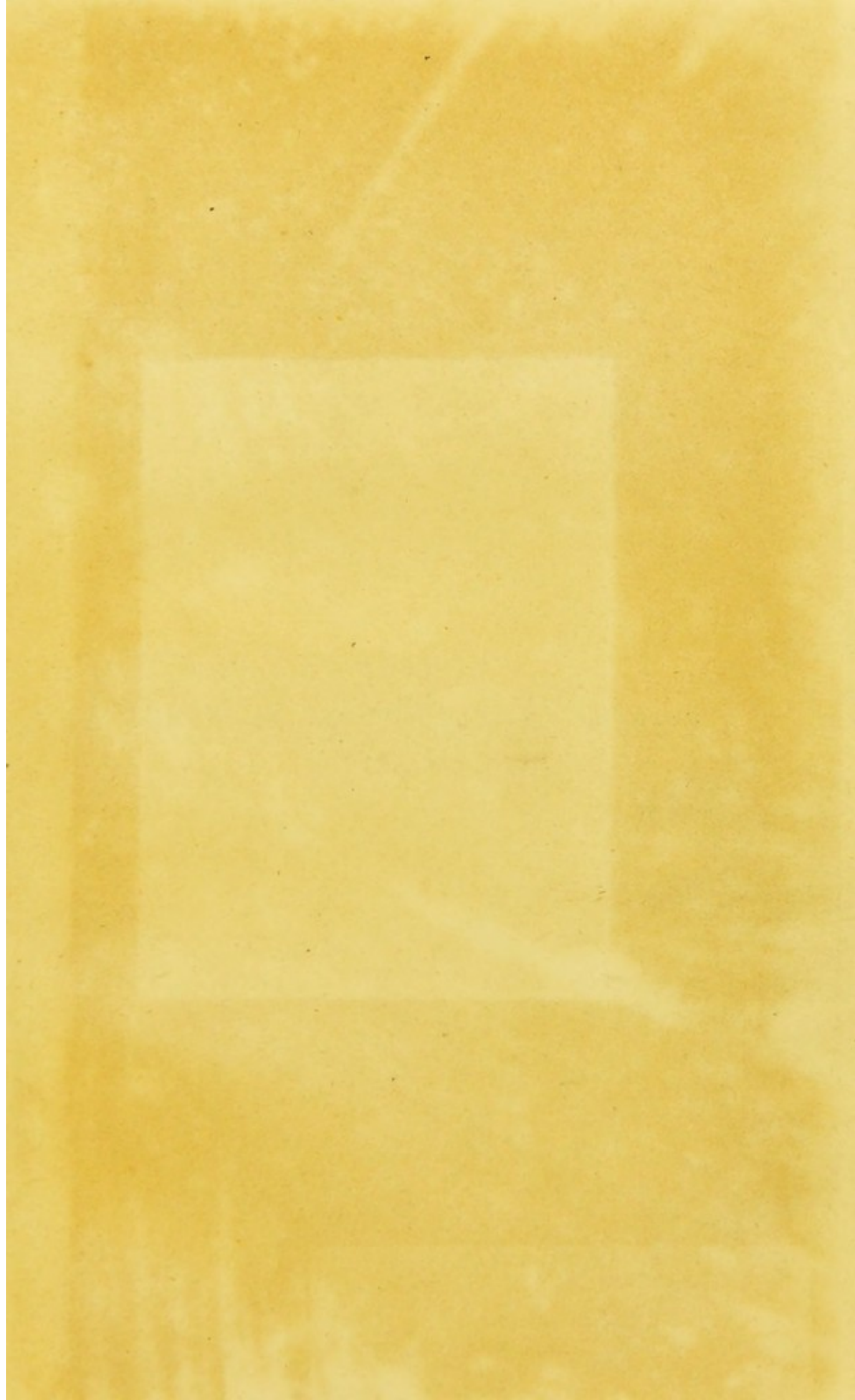
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LECTURES ON GENITO-URINARY DISEASES.

ABERDEEN UNIVERSITY PRESS

LECTURES
ON
GENITO-URINARY DISEASES

BY
J. C. OGILVIE WILL, M.D., C.M., F.R.S.E.

CONSULTING SURGEON TO THE ABERDEEN ROYAL INFIRMARY, AND EXAMINER IN
SURGERY IN THE UNIVERSITY OF ABERDEEN

WITH NUMEROUS ILLUSTRATIONS

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LECTURES

ON

GENITO-URINARY DISEASES

A COURSE OF LECTURES BY WILLIAM C. WELLS

LECTURED AT THE UNIVERSITY OF MICHIGAN, ANN ARBOR, MICHIGAN, IN THE YEAR 1894

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TO
SIR HENRY THOMPSON,

IN GRATEFUL ACKNOWLEDGMENT
OF THE INESTIMABLE BENEFIT DERIVED
FROM HIS TEACHING,
THIS VOLUME IS, BY PERMISSION,

Dedicated.



PREFACE.

THESE lectures were delivered in the Aberdeen Royal Infirmary,—the first five to students attending the class of Clinical Surgery, the sixth during a Post-graduate Course; but, although much of the original matter as well as the form has been retained, they have been entirely re-written in order to make them *en rapport* with recent views.

I have been frequently asked by many of my former pupils to publish in a permanent form some of the lectures to which they had listened, but this probably would never have been done had I not been urged by Sir Andrew Clark—from whom I received much unmerited kindness, and whose friendship I valued more than I can express—to write on a subject which he had much at heart, *viz.*, fever following urethral instrumentation. I had the satisfaction of submitting to him the conclusions at which I had arrived on that subject, and of receiving approval of the views expressed in the lecture now published. The lecture on Gleet appeared as a monograph some years ago, and I trust that it will not be less favourably received now than it was

then. Regarding the other lectures it will be apparent to those who do me the honour of perusing them that they contain nothing very original; but as the practical details of the various subjects treated of have been minutely described, the information they contain may be of some use to those commencing the actual practice of surgery.

I have to acknowledge my indebtedness to Professor Hamilton, Mr. Hurry Fenwick, Mr. Alex. Don, M.A., and to Mr. Macdonald of the Aberdeen Pathological Laboratory for assistance kindly given in providing illustrations for the volume.

J. C. OGILVIE WILL.

379 UNION STREET, ABERDEEN,
January, 1894.

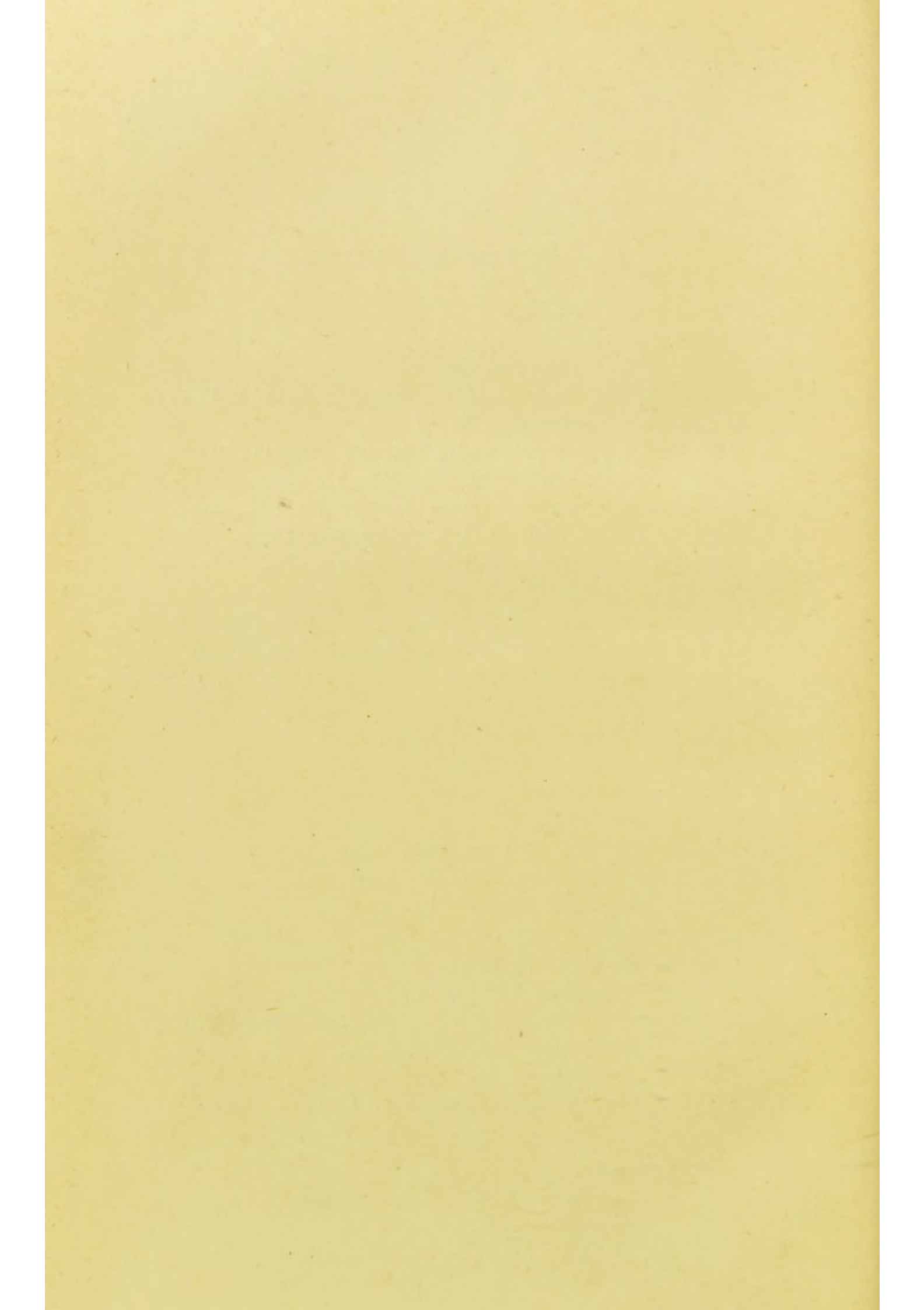
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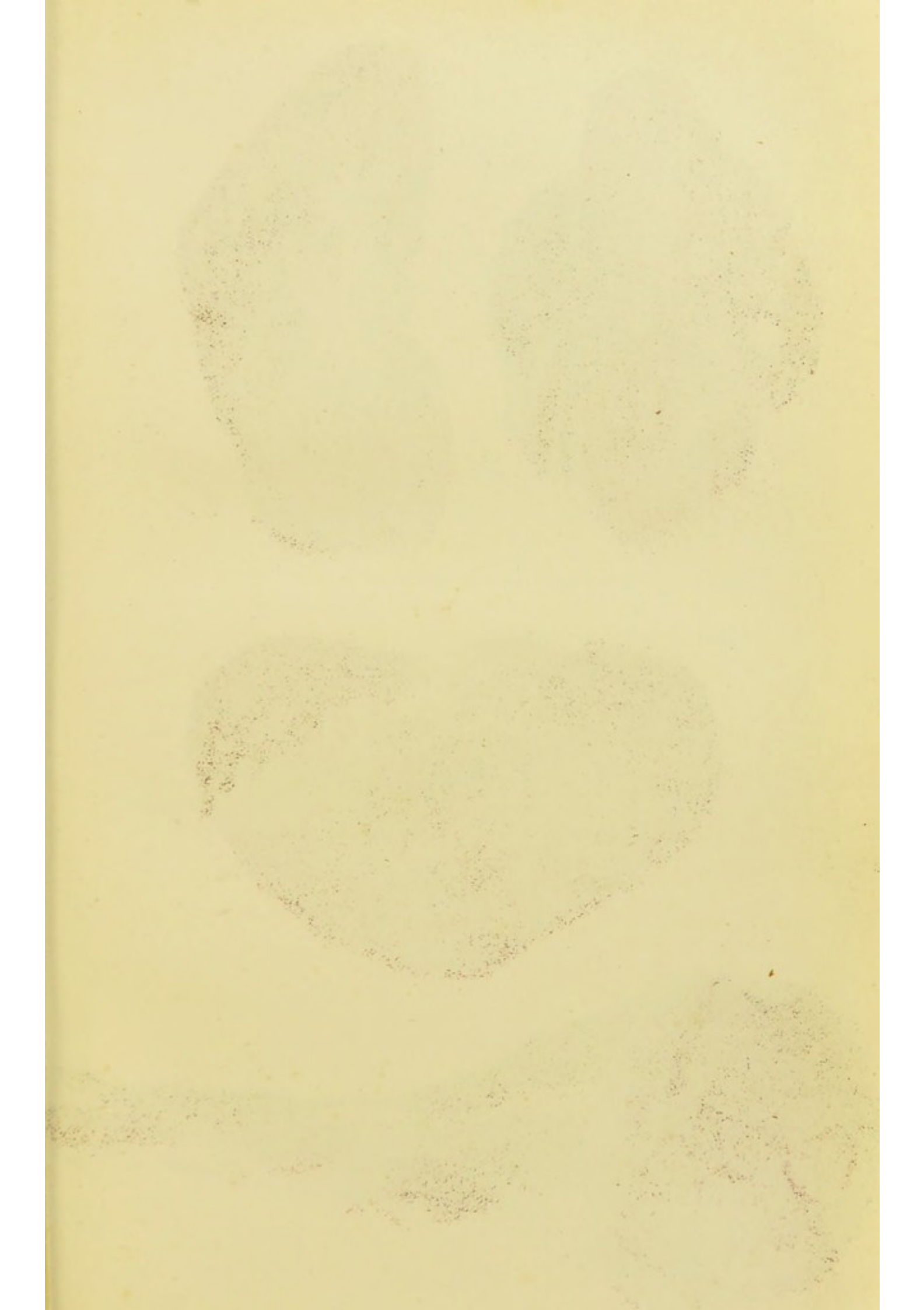
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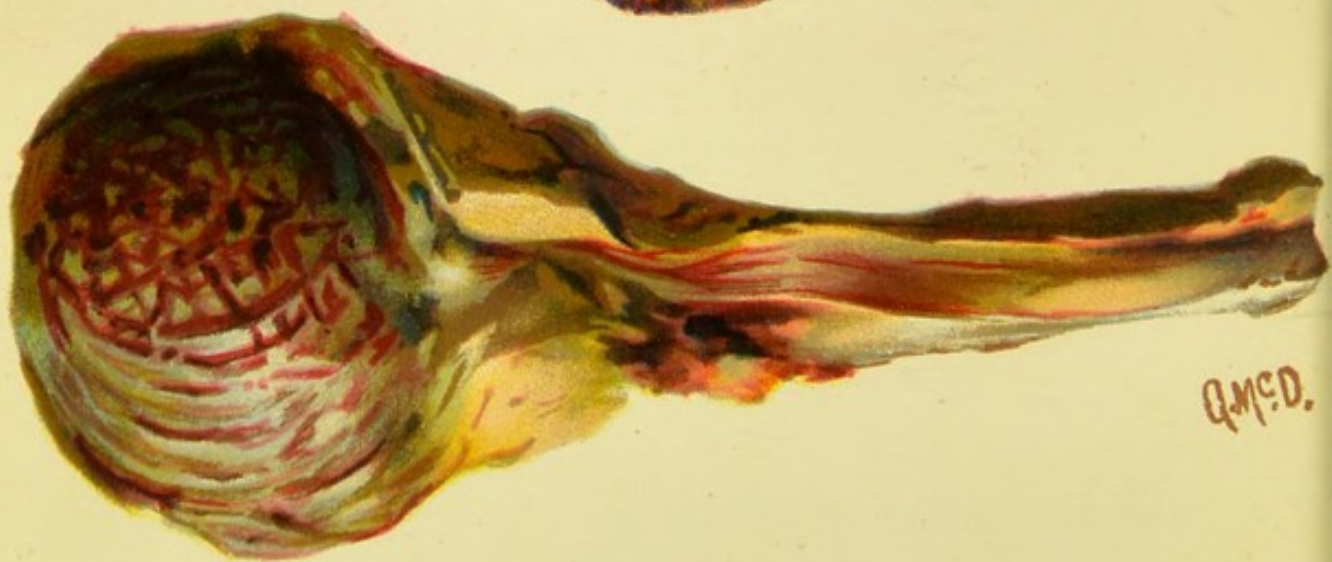


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Q.M.C.D.

EXPLANATION OF PLATE I.

Pathology of Catheter Fever from Preparations in the Pathological Museum,
University of Aberdeen.

Fig. 1.—Pyo-nephritis showing carbuncle-like groups of abscesses protruding on the surface.

Fig. 2.—Section of same showing abscesses arranged in isolated, somewhat wedge-shaped areas corresponding to the destruction of uriniferous tubes.

Fig. 3.—Another example of same showing abscesses on surface in an earlier stage.

Fig. 4.—Septic inflammation of bladder following catheterism—Mucous membrane deeply congested, and partially gangrenous. The centric and lateral enlargement of the prostate, which was very pronounced, is insufficiently defined in the drawing, but a stricture which was also present is well shown.



LECTURE I.

URETHRAL FEVER AND CATHETER FEVER.

TO-DAY, gentlemen, I wish to direct your attention to one of the commonest disorders met with in the domain of urethral surgery, and one which, strangely enough, attracted but little notice until the masterly expositions of Sir Andrew Clark directed the attention of the whole profession to the dangers frequently attending one of the simplest operations of the urethra—*viz.*, the instrumental removal of water from a distended bladder.

He described the conditions which he had often found to ensue under the name of Catheter Fever.

Fever following catheterisation, urethral exploration, etc., has been described by many writers, both at home and abroad, notably by Sir Henry Thompson, by Velpeau, Civiale, Guyon, Bonnet, Philips, Marx, Dolbeau, Malherbe, Gosselin, and Reliquet, and it has been for long a favourite subject for clinical instruction and examination in my own wards, but to Sir Andrew Clark undoubtedly belongs the credit of arousing the profession generally to the dangers of ordinary catheterism, and especially to the first use of the catheter in those suffering from chronic retention arising from prostatic obstruction, and by the timely warning thus given he has contributed not a little towards the saving of much unnecessary suffering, and many valuable lives.

Now, gentlemen, much diversity of opinion exists re-

garding the cause of the train of symptoms met with after the passage of instruments, and this, I believe, is due to the fact that two totally different disorders have been, and are still, generally regarded as one, although they seem to me to present such differences in the mode of their causation, their symptoms, and their results, that the confusion of the two by capable clinical observers is well nigh inexplicable. I hope to be able to prove to you to-day that my contention is a correct one, and if I succeed, our meeting will not be an altogether unprofitable one.

Let me introduce the subject by recalling to your minds the case of G. F., who is at present an inmate of one of my wards. His age is twenty-eight, and he was admitted ten days ago complaining of well-marked symptoms of stricture of the urethra, the result of repeated and long-continued attacks of gonorrhœa. On instrumental exploration of his urethra, a stricture in the membranous part of the canal was found. It admitted a No. 5 (French) easily, and 6, 7, 8 were passed without causing the least pain, or the slightest bleeding. He was told to remain in bed, which he did. In the course of the afternoon he passed water easily and without pain, and in a much larger stream than before. About an hour afterwards he began to shiver, and felt sick and vomited. Soon after the occurrence of the rigor he was visited by the house surgeon, who took his temperature and found that it was 101.8° . Two hours later it was 104° , and the patient had begun to sweat profusely. He had a restless and uncomfortable night, but improved towards morning, the temperature gradually falling, and when taken at the hour of visit it was only

a fraction above normal. The sweating had completely ceased, and he said that he felt all right excepting that he had a slight headache and felt rather stiff. He had made water several times without pain, and his urine on examination showed a copious deposit of urates, but was otherwise normal. Next day the patient was quite well.

The case is a well-marked example of urethral fever, a term which is applied to a pyrexial condition following the dilatation of a stricture by the passage of a bougie, or a simple urethral exploration. Urethral fever assumes different forms, the most common one being that presented by our patient, where we had, soon after the first urinary act subsequent to the instrumentation, a rigor, high temperature and sweating, passing away in the course of a few hours and leaving the patient with a headache and feeling of malaise next day. The temperature may be from 100° to 106° F.

The rigor most commonly, but far from invariably, supervenes on the first act of urination following instrumentation. The symptoms are of short duration, the patient frequently being quite well on the following day, or at most suffering from slight headache. This is what I regard as a typical case of urethral fever, but many divergences from this type are met with. There is, for example, a form of urethral fever where one or two slight rigors, with slight fever and no sweating, constitute the entire symptoms of the malady; and there are cases—I met with one recently—where the shock is so profound that prolonged and extreme collapse speedily follows the rigor (my patient was in this state for two days, but ultimately recovered), suppression

of urine, uræmia, and death ensue. Another point that should be noticed in connection with urethral fever is its uncertainty, for it is indeed a most wayward disease. In one case, for example, it will only occur on the occasion of the first instrumentation, in another it will appear every time, and in a third it will be found that after an instrument has been passed on many successive occasions without the occurrence of the slightest constitutional re-action, when the same operation is practised in exactly the same manner and under precisely similar conditions, a sharp attack of urethral fever will supervene.

Various explanations of the conditions just referred to have been advanced. Some have stated that urethral fever arises from absorption of urine through some damaged portion of the urethra, where the instrument had abraded the mucous lining of the canal, and this view was founded chiefly on the fact that the symptoms of the disorder did not show themselves until after the first act of micturition subsequent to the operation. This view cannot be upheld for two reasons—*viz.*, first, because urethral fever is met with very frequently when the urine is absolutely normal, and where its absorption would be, as experiment has shown, perfectly harmless; and second, because in many cases no injury to the urethral walls has taken place. Further, as I have already said, urethral fever sometimes precedes, instead of follows, the first act of urination.

It has been stated that those who have resided abroad are more prone than other individuals to suffer from fever following instrumentation, but I cannot say that this has been my experience.

The opinion that fever following urethral instrumentation is due to the introduction of putrefactive germs into the bladder has had many advocates, but I, for one, cannot possibly accept it, for I have seen pyrexia following the use of the most carefully sterilised bougies. Moreover, it is well known that urethral fever may arise when the instrument has only partially traversed the urethral canal, and has not reached the bladder at all.

Another explanation is based on the state of the kidneys prior to the commencement of urethral treatment, some surgeons holding that urethral fever is the result of a damaged condition of the kidneys; but one valid objection to this view must at once occur to the mind of the least experienced among you, *viz.*, that while ordinary catheterism or the simple passage of a bougie may be followed by urethral fever, the performance of much more serious operations, implicating the urethra, may, in the same subject, be unattended by it.

This fact is so well known that it seems almost unnecessary to cite any evidence in proof of its correctness; but if such is wanting, I may mention the case of a man, recently in Jacob's Ward, in whom the passage of a bougie for the dilatation of a stricture was followed by rigor, a temperature of 105.4° F. and profuse sweating; and this happened not once but on several occasions, yet the subsequent performance of internal urethrotomy gave rise to no untoward symptoms. I may tell you also that in the case just mentioned no attempt was made to prevent the access of urine to the urethral wound, for the patient was allowed to urinate when he felt the desire, and of this permission

he availed himself soon after the operation, and subsequently when necessary.

This case seems to me to be an argument not only against kidney disease as the cause of urethral fever, but it is also a refutation of the urinary absorption theory, for it must be admitted that there was far greater opportunity for the absorption of urine after the urethrotomy than after the dilatation, yet no sign of urethral fever showed itself after the former, while it was well marked after the latter.

We must therefore look elsewhere for an explanation, and I think that we can find it in the reflex theory. I believe that a local irritation, felt or unfelt, is produced at the time of instrumentation, and that this leads to the propagation of certain disorderly reflex discharges ; by this I do not mean a neurosis leading to perverted metabolism with the manufacture and subsequent absorption of noxious alkaloids, but that urethral fever is simply an exaggeration of the shudder seen when, after long repression of the desire to urinate, a perfectly healthy man empties his bladder, or of a similar condition seen any day in the horse.

I must not, however, omit to tell you that cases of very different significance and susceptible of a very different interpretation are often met with after the passage of instruments in young and comparatively healthy persons ; when I say comparatively healthy I mean those who have no other organic disease than some urethral affection. Sir Andrew Clark tells me that he is very frequently called to see such cases in consultation with surgeons, and that the results he has seen have been most disastrous. I may shortly relate the history of a most telling example.

A gentleman, *æt.* 35, suffering from gleet, consulted a surgeon in Edinburgh, who passed with considerable force several large metallic bougies, causing great pain and followed by considerable hæmorrhage. This was followed by complete retention of urine, for which a soft catheter was passed by another surgeon. Much discomfort was felt for a couple of days, but no general symptoms manifested themselves until five days after instrumentation, when the patient was suddenly attacked by rigors and by pains all over his body, but most intense in his head and legs. He thought that he had caught a chill, and went to bed and took a dose of aperient medicine, which was followed by violent diarrhœa.

I saw him next day, when he was complaining of general pains over his body with intense headache, sickness, a furred tongue, a temperature of 102° , and a pulse of 120. On the following day he was suffering much from pain in his anus, but rectal examination, which was intensely painful, revealed nothing abnormal in his rectum or prostate. There was a slight puriform discharge from his urethra. He could urinate easily. The urine contained a trace of albumen and some pus cells. A sharp attack of epididymitis was the next symptom, and this was followed in a few days by swelling in his left upper arm, where an abscess formed which was opened and healed satisfactorily. Great pain in his right hip-joint with slight swelling was the next symptom, and this persisted for some weeks, and then an abscess formed over the right trochanter. Seven weeks from the commencement of the disorder, after his temperature had been absolutely normal for some days, and the sweating,

which had been profuse from the beginning, had ceased, he was suddenly seized by difficulty in breathing, the respiration being of the Cheyne-Stokes type. He himself thought that he was in imminent danger, and his appearance and the mode of his respiration would have led one to suppose that he had just cause for his apprehensions, but careful examination showed that his heart and lungs were free from disease and there were no signs of cerebral or other disorder discoverable. His temperature, which was normal at the commencement of the attack, rose to 101° in the evening but fell next day. Under treatment the symptoms gradually disappeared in thirty-six hours. A few days afterwards he began to complain of pain in his right ankle, which lasted for about two weeks, and was accompanied by a rise of temperature and sweating, and was followed by pain and swelling over his right instep, which gradually disappeared, and convalescence was ultimately established about three months after the commencement of the attack.

I do not think that any of you will doubt that this was a case of pyæmia resulting from the direct absorption of pus from the urethra, nor will you doubt that the surgeon acted, to say the least, unwisely in the treatment he adopted, the result being that the patient underwent a long, a painful, and a dangerous illness totally unnecessarily.

Similar cases have been recorded by other surgeons where the symptoms have been much more aggravated, such as in one met with by Mr. Syme, when there was supuration and disorganisation of a knee-joint, destructive inflammation of an eye-ball and death; but I hardly think that such cases should be designated as urethral fever any

more than that pyæmia, springing from a pus-secreting surface in some other part of the body, should be named after the locality in which it arose.

When urethral fever occurs in the course of other diseases, as it not infrequently does when the use of a catheter is called for, it may lead to some confusion. Let me give you the outlines of such case, as it may impress this fact on your minds.

A man, *æt.* 29, who had passed through a severe attack of typhoid fever, but whose temperature had been normal for five days, and while the greatest possible care was still being taken in regard to diet, suddenly found himself unable to urinate. When I saw him his bladder was distended and he was suffering much discomfort, but his temperature, taken just before my visit, was only a fraction above normal. I passed a full-sized aseptic catheter without the slightest difficulty and drew off a large quantity of urine. About one hour after this he had a rigor, and when the temperature was taken about three hours after catheterism it was 104·6 F.; two hours later it was 105·2, soon after which he began to sweat profusely, and his temperature gradually fell; and next morning it was slightly subnormal. The retention continued for some days, and he was relieved by catheter without the occurrence of the slightest untoward symptoms.

I have recited this case as, had I not been very familiar with symptoms following instrumentation, I would undoubtedly have ascribed those which presented themselves to a relapse after typhoid, and not to their proper cause.

CATHETER FEVER.—This form of disorder is chiefly

met with in men suffering from retention resulting from enlarged prostate. It frequently commences on the second or third day after catheter life is entered upon, and its symptoms are those of irritative fever. The patient is sick and feverish, complains of nausea, has a red tongue which becomes dry and contracted, the skin is harsh and dry, and sometimes clammy; he becomes gradually weaker, sinking slowly, death occurring two, three, or four weeks afterwards; or, if the symptoms are not very pronounced, he may make a gradual recovery.

The urine, which when first drawn off may be comparatively healthy in appearance, soon becomes alkaline, and deposits a large quantity of stringy mucus in the vessel; it frequently contains pus and swarms of micrococci.

The occurrence of the train of phenomena above described attracted my notice many years ago, and I have on frequent occasions directed the attention of our clinical class to the possible dangers of catheterisation in cases of chronic retention; and I may mention here, before entering on the causes of catheter fever, that it may be prevented with a very considerable amount of certainty by attention to two matters of detail—namely, the use of an aseptic catheter, and at first drawing off only part of the retained urine, instead of completely emptying the chronically distended viscus, two points of paramount importance which cannot be over-accentuated.

Regarding the causes of catheter fever, I was for long under the belief that it had a mechanical origin—that the sudden removal of the support afforded to the walls of the bladder by the retained water so affected the

lining membrane of the vesical cavity that a low form of inflammation resulted, and subsequently spread to the kidneys. This belief was engendered by the clinical fact to which I have just now alluded—namely, that if the bladder be only partially emptied catheter fever does not ensue. But a recent and careful consideration of the subject has led me to adopt a different view ; for, while I still believe that the changes in the condition of the circulation arising from the diminution of pressure have a not unimportant bearing, I am now of opinion that the cause of catheter fever is the introduction of putrefactive germs into the vesical cavity, and that such is the most likely explanation is proved by *post-mortem* examination of the bodies of those who have succumbed to this malady ; for the appearances met with are precisely similar to those encountered in other parts of the body when sepsis is the cause. The bladder is generally, as it is in the one I now show you, inflamed and sloughy, the ureters and pelves of the kidneys congested, the kidneys are riddled with small abscesses, and micrococci abound everywhere, the bladder, ureters, and straight and convoluted tubes swarming with them and they are found within the capsules of the Malpighian bodies where they accumulate in quantity sufficient to compress the tufts. And here the question arises, How do the germs of putrefaction gain access to the bladder ? A few years ago the answer would have been a very easy one, but since the value of an aseptic catheter has been universally acknowledged, we have to look further afield, and in doing so we may inquire what bearing the partial or incomplete emptying of the bladder has on this point. To my way of thinking

it has a very important one, and furnishes the required explanation ; for if the bladder be completely emptied, there is great probability of regurgitation of air through the catheter taking place, and this is more likely to occur if digital compression of the hypogastrium has been required to cause the urine to flow, or if the patient has used voluntary efforts to expel the last few drops of water ; and both of these occurrences are probable enough, for the muscular expulsive apparatus of the bladder is frequently almost, if not completely, useless. If only a partial withdrawal of the vesical contents be practised, the danger of the ingress of germ-laden air is obviated, and thus we are furnished with an explanation of a clinical fact, the existence of which I have long been familiar with, but which I have been unable until lately to satisfactorily account for. The putrefactive germs having thus gained access to the bladder, find in its lining membrane, which is in a stretched and weakened state, a very suitable nidus for their development, the result being the production of the pathological changes now described, and which I have demonstrated to you in the specimens now on the table. An analogous condition is seen in the female when a dirty catheter is used after labour, or when some of the discharge is introduced into the bladder on a catheter, the attendant having experienced difficulty in finding the urethral orifice, and having anointed the instrument with highly septic matter issuing from the vagina. In those cases the urine speedily becomes decomposed, but the bladder walls, being free from pre-existing disease, are not in a condition favourable to the growth of bacteria, and as a rule the constitutional symptoms, if

present, are by no means well marked, and the local ones are comparatively transient, the disorder being speedily recovered from.

The train of phenomena just mentioned is, I am glad to say, not often seen in my wards now-a-days, but unfortunately some of you had an opportunity of witnessing a case presenting such symptoms not long ago, and I dare say that as the situation was rather a dramatic one you have not forgotten it. One morning on entering hospital I was met by a student who was temporarily acting as house surgeon, and who had had but little experience in the treatment of urinary disorders. He told me that a case of prostatic retention had been admitted during the night, and that he had passed a catheter. I immediately asked if he had completely emptied the man's bladder. His answer was: "Yes; I did not leave a drop in it". My reply was: "The man will be dead in three weeks"; and you have unfortunately seen the verification of my prophecy. Had the bladder been only partially emptied I firmly believe that the patient would have recovered.

Such then are the clinical and pathological features presented by these two disorders, for I think from what I have said to you that we must look upon urethral fever and catheter fever as two diseases almost as markedly distinct as typhus fever and typhoid. And now let me say a few words regarding their treatment, which is especially preventive. Many drugs have been suggested as prophylactics of urethral fever, but if any have any power quinine undoubtedly holds the first place. I must however say that I have but too often been disappointed with it. It may be

given in ten grain doses, one dose being administered half an hour before instrumentation, and another should any signs of urethral fever show themselves. Van Buren used quinine with morphia ; Harrison, aconite ; Gouley, perchloride of iron ; while some employ antiseptics, such as salol and boracic acid ; others rely on stimulants ; others on salicylate of soda and salicine ; and chloroform has also its advocates. For my own part I believe that the surest way to avoid urethral fever is to apply cocaine freely to the urethra in the form of an injection, or as a lubricant to the instrument, to use flexible instruments, to make sure that they are absolutely aseptic, and to employ them with the greatest care and gentleness.

When urethral fever actually declares itself, the patient should go to bed immediately ; he should be thoroughly well covered, and surrounded with hot bottles. Diaphoretics should be administered with the dose of quinine already referred to, or a glass of brandy and hot water with a few drops of laudanum may be given. Should suppression of urine occur, hypodermic injections of pilocarpine should be had recourse to, and the other means of treating that dread condition should be put in force.

In those who are prone to suffer from attacks of urethral fever during the treatment of stricture, the method of treatment known as continuous dilatation should be preferred to gradual dilatation, for you will find that the patient may remain unaffected by, or suffer only slightly from, urethral fever while a catheter is lying in the stricture, and yet have violent attacks of it each time that a larger instrument is passed. This might be used as an

argument in favour of urinary absorption as a cause of urethral fever were it not well known that during continuous dilatation urine passes not only through, but by the side of, the catheter.

The treatment of catheter fever has already been so far referred to, but let me again remind you of the paramount importance of the most rigid asepticity of your instruments, and do not forget that Koch's experiments have proved that aqueous, and not oleaginous, preparations of antiseptics should be relied on. The catheter should be well washed with a watery solution of sodium bicarbonate, or some other reliable antiseptic, and then oiled immediately before use. Need I again remind you that, when "commencing catheter-life," as Sir Andrew Clark puts it, the bladder should never be completely emptied? I think that I have already dwelt sufficiently on the topic, so I need say no more.

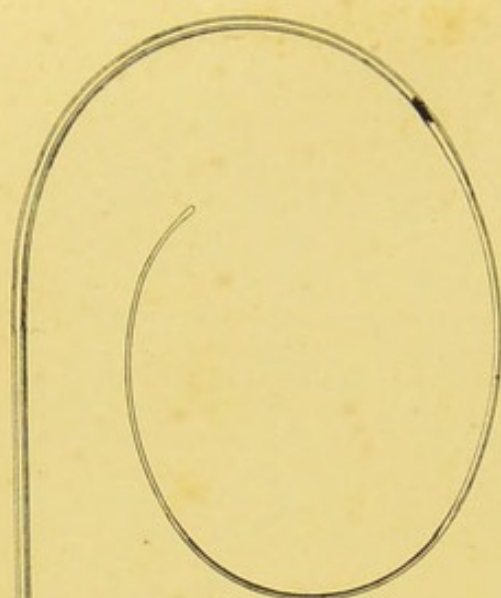
The administration of a course of bladder antiseptics given by the mouth before commencing catheterism has been strongly advised, and I think that this plan should be regarded with favour. Salol and boracic acid are the most suitable. Either of them may be given in ten grain doses thrice daily.

Should catheter fever declare itself, the antiseptics just mentioned may be continued, and the bladder may be washed out with boracic lotion, or with one containing quinine. The patient should be kept warm and in bed, and his flagging powers should be supported by the frequent administration of light, nourishing, and easily assimilated food, and a moderate supply of stimulants. With such treatment cases do undoubtedly recover, but too many

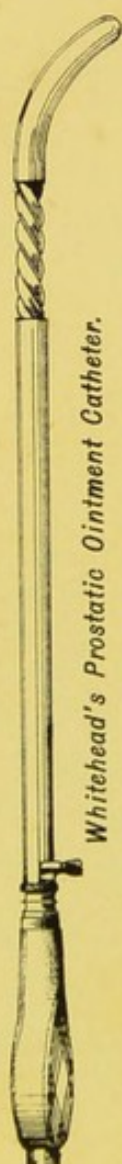
of them sink gradually, and die in the course of a few weeks, in spite of the best directed and most anxious efforts to tide them through this most dangerous disorder.

Before I have done let me express the hope that you will read aright the lesson which Sir Andrew Clark, by his timeous utterances, has so well taught, *viz.*, that meddling urethral instrumentation is an evil of the first magnitude, and that so long as a patient can go on safely and fairly comfortably without the use of a catheter he should most certainly be encouraged to do so.

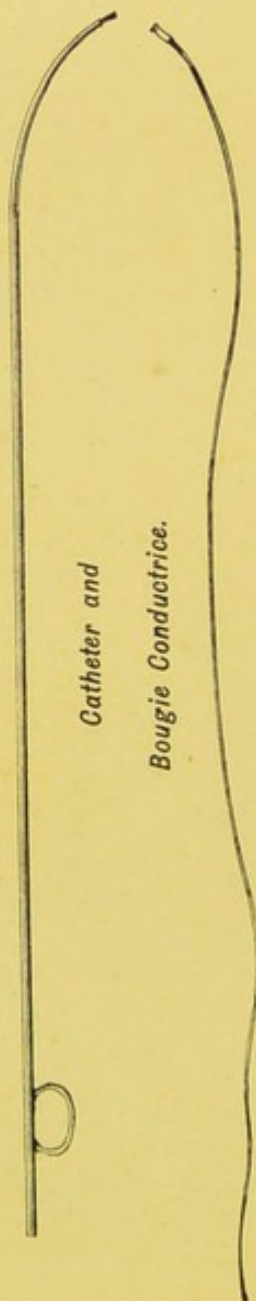




Harrison's Whip Catheter.



Whitehead's Prostatic Ointment Catheter.



Catheter and

Bougie Conductrice.



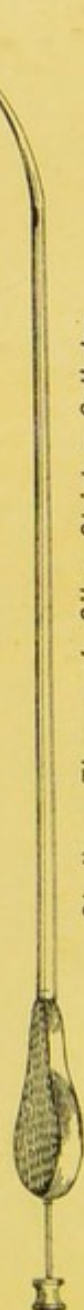
Mercier's Coudée Catheter.



Bicoudée Catheter.



Prepared English Gum Elastic Catheter.



Sir Henry Thompson's Silver Stricture Catheter.

LECTURE II.

TREATMENT OF RETENTION OF URINE.

GENTLEMEN, we have recently had under treatment a considerable number of cases of retention of urine due to various causes, but chiefly to stricture and prostatic enlargement, and I do not think that we could find more profitable occupation for our lecture hour than to discuss the means most appropriate for the relief of such cases. Each one of you is sure sooner or later to be called upon to treat cases of this kind, and on your ability to combat the difficulties you may thus encounter much of your future progress in life may depend; it is therefore incumbent upon you to master, as far as possible, all the details connected with the successful management of urinary retention. And I may tell that the pleasure you will yourselves derive when your efforts are crowned with success will be an almost sufficient reward, but in addition a more substantial recompense is generally forthcoming, for in no other class of cases will you meet with more gratitude than in those where the patient has such distinct evidence of your skill. Sir Henry Thompson has well said that "It is not like the questionable result of a dose of medicine which a sceptical patient may persist in attributing solely to our great ally, the curative power of nature. There can be no uncertainty

as to the result of your treatment if, after twenty-four hours of agony, relief follows your dexterous use of the catheter, and the two or three pints of urine which the patient was unable to void are withdrawn by your hand. He tells you that he is in Heaven, and he never will doubt for a moment that you were the author of his translation." Or he may say as an aged clergyman, who had been suffering for nearly forty-eight hours from prostatic retention, said to the late Professor Pirrie, after he had succeeded in passing a catheter, that "the sound of the water trickling into the recipient vessel was the most blessed music he had ever listened to".

And now, gentlemen, let me advise you as to the line of action to be followed when you are called upon to treat a case of retention from stricture of the urethra. First, you have to determine that the cause is really stricture, and with this in view you should in every case first explore the urethra by means of a full-sized bougie—preferably an acorn-headed one. Select one corresponding in size to that of the urethral orifice, for, as you know, any instrument passing through that opening should traverse the whole urethra without difficulty, provided that no abnormal obstacle exists in it. I wish to impress upon you the advisability of using a full-sized instrument for urethral exploration on all occasions, both during the crisis of retention, and at other times, for, if you act otherwise, you may fall into grievous errors. For example, not long since I was sent for by a medical man to relieve a patient who was suffering from retention. For an hour and a half previous to my arrival the doctor had been trying a great

variety of small catheters for the purpose of penetrating a stricture which he supposed existed, but without more result than inflicting considerable pain on the patient and not a little injury on his urethral walls. Somewhat to the amusement of the doctor I selected a full-sized blunt-ended French catheter, partly for diagnostic purposes, and partly because I had a shrewd suspicion that an enlarged prostate, and not a stricture, constituted the obstruction. The instrument slipped into the bladder with the greatest ease, the patient was relieved, and the diagnosis was completed. Again, not long ago a man came to this hospital saying that he had been suffering from stricture for eight years, that he had had various attacks of retention of urine which had been relieved by small catheters, but that no attempt had been made to dilate his stricture, that his stream of water was extremely small—he compared it to a darning needle—and that his calls to micturition were almost constant. I introduced a full-sized instrument, it was arrested at the bulb of the urethra, not by a stricture but by a calculus. I passed a No. 4 English catheter by the side of the stone right into the bladder without any difficulty, and a large quantity of water was evacuated. The calculus was then readily extracted by means of a loop of silver wire—by far the simplest and most effective way of dealing with such foreign bodies—and immediately afterwards a full-sized bougie was passed into the patient's bladder. He had no further urinary difficulties. Let me cite one additional instance which may bring the matter still more forcibly home to you. When examining a student for his degree, I asked him to demonstrate to me that a

patient before him was the subject of stricture, a fact which I happened to know that the student was already acquainted with. After some delay he selected from the box of bougies offered to him a small one—No. 4 I think—and passed it into the patient's bladder in a masterly manner, thus proving that he could pass an instrument, but not that he could diagnose the disorder.

These cases will, I hope, serve to impress you with the wisdom of properly conducted urethral exploration, and in connection with this let me remind you that the passage which you have to explore is not really an open tube, but a sinuous passage in which there are many traps to catch the unwary, such as the lacunæ—normal and morbid—the varying calibre of the urethra in its different divisions, and spasm of its muscles by which organic stricture may be simulated. Bearing all this in mind, pass the instrument gently into the passage, and if it is arrested in its course, note the distance from the meatus at which the arrest takes place, and endeavour at the same time to ascertain as accurately as may be possible the exact character of the obstruction encountered. Having determined the fact that you have a stricture to deal with, you will now proceed to attempt the relief of the retention. Here we are met with the question as to what kind of instrument should be employed; is it to be a rigid or a flexible one, and if the latter, what should be its composition? Much diversity of opinion still obtains on these points, and even in the limited field presented by this hospital you will find an absence of agreement, for in one ward you will be taught that rigid catheters are to be preferred, while

in another you will hear me continually descanting on the virtues of flexibles ones. In Scotland generally, Liston's dictum that a man should know the anatomy of the urethra and guide the catheter in accordance with that knowledge is still upheld, but, for my own part, believing that delicacy of touch and gentleness are the essentials, I have long given my adhesion to the views held by nearly all French and American surgeons, and by many Englishmen, that, with suitable flexible instruments, results can be obtained with a degree of certainty, and with an absence of suffering to the patient, which are totally unattainable with stiff ones. I began my surgical life with a strong faith in metallic instruments, and this continued until I fell under the spell of Sir Henry Thompson's teaching, an influence which no one, with an impartial mind, can possibly resist, and which speedily made me abandon the paths in which I had been trained, as I feel satisfied will happen in the case of any of you who may have doubts as to the soundness of my teaching if you will only peruse the most fascinating pages of that most original, facile, and expressive writer, and the greatest authority on all matters connected with the urinary tract not only in this but in any country. If you do this your doubts will at once vanish, and you will agree without reservation with him when he says: "I pity the patient who has a metallic instrument thrust into his body by a knowing man at anatomy". Holding these views I would advise you to place your trust in flexible instruments, and I am satisfied that if you accept this advice you will never regret it. As to the exact form to be employed I shall have much to say presently,

but first let me premise with a few words on the qualifications necessary to the individual who would cope successfully with the difficulties often presented by stricture, for the fact cannot be disguised that the treatment of a case of stricture may be one of the most difficult operations in surgery, and it is only by the possession of certain qualities that one can hope to succeed. Patience, perseverance and confidence are absolute essentials, and without these attributes, failure is almost certain. You must dismiss from your minds, as far as possible, the existence of impermeable strictures, for it has been truly said that the word impermeable as applied to stricture is like impossible in regard to other things, it paralyses determination and lessens effort, and most surely paves the way to failure and discomfiture. You should have graven deeply in your minds the axiom of Mr. Syme: "That wherever the patient has been able up to the time of the attack to pass water, in however slender a stream, there must be a passage through which an instrument can be passed into the bladder". You should believe further that if an instrument can be passed, you individually are the man to pass it, and that where you fail, no one else can succeed. That, I believe, is the great secret to success in this department of surgery, and if so, the egotism has its complete justification in the result. Experience undoubtedly does much for a man, and each of you can gain information of the highest value from the study of his own urethra, and I would most strongly urge you to practise the passage of instruments on yourselves before you attempt to do so on other people. There is no difficulty and no danger in the proceeding, and the

dexterity that you will then acquire may be of infinite importance and assistance to you.

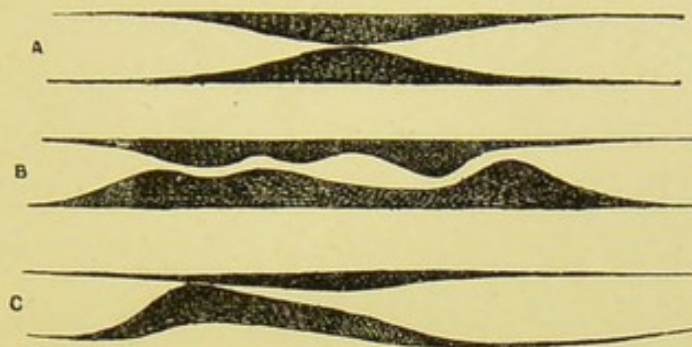
Having made up your minds that you are to succeed, however difficult the case may be, and not forgetting that delicacy of touch and gentleness, and not force, are to guide you, take a small—say a No. 2—English yellow gum catheter, and having made sure of its asepticity, holding it gently between the forefinger and thumb, insert it into the meatus, and pass it carefully along the urethra until the obstacle is reached. Now attempt to insinuate it within the orifice of the stricture, bearing in mind that the opening may not be central; twist the catheter slightly until you satisfy yourself that its point is grasped—the one absolute sign by which you may know that you are on the right track—then try to push it onwards, and if it enters the bladder, you may, after emptying it of its urine, either leave the catheter there, or withdraw it. If much difficulty has been experienced in the introduction of the instrument, from the state of the stricture, from the presence of false passages or other causes, it may be tied in so as to allow of the patient urinating through it when he desires, and it will, in addition, cause rapid and decided dilatation of the contracted part or parts, for as Mr. Timothy Holmes says: “As much progress may often be made in the dilatation of a stricture in ten days by this method as would have been in a month by gradual dilatation”. Sir William Savory speaks even more strongly in this passage, *viz.*: “The mode of action of this plan of treatment contrasts favourably with that of any other; the stricture is overcome, the abnormal tissue is removed by constant pressure. . . . It acts not by a mechanical force,

but by a physiological process. Of all modes of treatment this undoes the mischief in the most natural manner; and here, I submit, is its claim to be considered the best."

In connection with this I may show you the best plan for tying in a catheter, which may be easily and quite securely accomplished by placing a small ordinary elastic band—such as are sold by stationers—in the groove behind the corona glandis, and attaching two waxed silk threads to the band and then fixing them to the proximal end of the catheter. This mode is much more cleanly than, and certainly as efficient as, the strips of sticking plaster, worsted threads, etc., which are so often used.

If the stricture should be too tight to admit the instrument first tried, then a No. 1 English may be substituted for it. Should you still fail, the advice generally given is to take a very small metal catheter such as I now show you, *viz.*: Sir Henry Thompson's probe-pointed silver catheter, the last two inches of which are of solid soft silver and can be bent to any desired curve, with an olivary tip, and a stylet filling the instrument right up to the eye so as to give it additional firmness, or Spence's silver, or Heron Watson's probe-pointed steel, catheter. The latter measures at its point about one half (English scale) and gets gradually larger as the handle is reached. If you feel inclined to try stiff instruments you will find any of these excellent, but I do not advise you to do so, as the use of a suitable filiform bougie is a far more excellent way, for remember that a stricture is not a mere membranous diaphragm with a hole in its centre or at its side, but it may be, and often is, a tortuous irregular passage an inch or more in length, with walls perhaps hard,

gristly and unyielding, and with its floor drawn up towards its roof. Now which of these two instruments do you



Diagrammatic representation of Stricture (*after Nicoll*).

- A. Simple Stricture.
- B. Irregular or tortuous Stricture.
- C. Stricture with orifice placed eccentrically.

think the more likely to safely traverse such a passage? Is it this inflexible metallic probe, ready to make a false passage on the application of the slightest force, which is, I fear, only too often employed, or this soft, yielding one, which, as you see, I can twist into any shape, and with which you scarce draw blood even if you tried? Whatever you may think I have no difficulty with an answer. I must, however, confess that when I first saw filiform bougies I regarded them with amusement, but the very first case where I used them engendered a very different feeling, and this, I doubt not, will be your experience if you will only try them. Filiform bougies are made of various materials, but the most useful are the French, and those made of whalebone. This French filiform bougie, which I hold in my hand, consists of the same material as the ordinary black catheters; it measures two millimetres at its point, which is olivary, and gets gradually thicker as the shaft is reached, and hair-like though it is, it has a certain degree of firmness quite sufficient to carry it through a stricture. This one, again, is made of

whalebone, and it is still smaller in diameter and ends in an olive point. The advantage of whalebone is that when steeped in hot water it becomes so soft that I can, as you see, give it any shape I choose, and now, when I have dipped it in cold water it retains the twist I gave it, and you can readily understand that it will not be so easily affected by the heat of the body as the other one, and that it will therefore be more suitable if the attempts to pass it are prolonged.

The mode of using filiform instruments is similar to that just described in the case of the small English catheter. Some difficulty may be experienced in reaching the face of the stricture with the bougie on account of its point becoming engaged in some one or other of the normal lacunæ or in the mouths of morbidly enlarged follicles, or in false passages. Various manœuvres have been suggested by which this complication may be avoided; you may, for example, fill the canal with oil by means of an ordinary urethral syringe, and, while retaining the oil within the passage by making pressure at the meatus, and while the passage is thus distended, a bougie may be readily passed. Or you may pass the bougie through a piece of catheter, which has had its point cut off so as to leave it open at both ends, and which has been previously inserted into the urethra; or where there are a number of false passages you may fill them all with filiform bougies, first one being passed, and then another, and so on. After all the openings are filled with bougies, each one should be tried in turn until the one lying in the stricture is found, which will be known by its being grasped, then the other instruments are withdrawn, and the remaining bougie is pushed into

the bladder. When the bougie is fairly within the stricture, its further progress may be suddenly arrested by muscular spasm, and it may be so tightly grasped that it may be momentarily impossible either to pass it into the bladder, or to withdraw it. When working with so slender and flexible an instrument, the use of force would be manifestly out of place, as the result would inevitably be fracture of the bougie, or bending it in such a way as would utterly defeat the object in view, therefore the best rule to follow in such circumstances is to leave the bougie in position for a few minutes until the spasm ceases, when little difficulty will be found in guiding it into the viscus.

In some cases, however, after the stricture is traversed by the bougie it may still be arrested before the bladder is reached from its point becoming entangled in the meshes of the reticulated mucous membrane lying behind the contraction; if this happens the bougie should be slightly withdrawn, and a fresh attempt to lodge it should then be made, the instrument being advanced in a rotatory manner, the twisting movement rendering the probability of entanglement much less than if it be simply pushed straight onwards. Filiform bougies with angular points are chiefly useful in assisting one in finding the orifice of a stricture when it is placed to one side instead of being in the mesial line; when the strictured point is reached, the bougie should be gently twisted from side to side until the point engages itself in the opening, when it may be pushed through the strictured portion of the canal into the bladder. Whale-bone bougies with twisted or corkscrew points are useful in traversing long and tortuous strictures.

I have somewhat digressed from the point, but let us now suppose that the filiform bougie has been passed, and you will, not unnaturally, feel inclined to ask what has been gained by the procedure. Is not the last condition of the patient worse than the first? for is not his urethra still more firmly plugged than before with a solid cork in the shape of a bougie? This would be true had we no means of utilising the bougie, but fortunately we have. This filiform bougie has a small silver female screw at its proximal end, and here I have a silver catheter ending at its point in a male screw. By means of the screws I attach the catheter to the bougie—the latter still remaining with its point well through the stricture, and by pushing the catheter into the urethra it is guided by the bougie into the bladder, the latter part of the instrument curling up in that viscus. Again, instead of a bougie I may use a long slender guide of whalebone, and having passed it through the stricture, I slide a small catheter with open ends over it, and while withdrawing the whalebone guide the catheter can be readily slid into the bladder. Or I may use a Harrison's flexible whip-catheter, which is simply the *bougie conductrice* and catheter, already described, in one, instead of in two pieces.

If the crisis of retention of urine is not very urgent, a filiform bougie, *per se*, may be left in, as it will, in a very short space of time, act as a guide to the urine, which will pass by its sides, and the patient will soon be enabled to empty his bladder in this way, without the aid of a catheter. M. Phillips has suggested a somewhat similar mode of treatment in cases of retention. He introduces a whalebone

filiform instrument, leaves it in for a few minutes, then withdraws it partially, the withdrawal being followed by a squirt of urine, and he goes on repeating this manœuvre until the contents of the bladder are sufficiently evacuated to relieve the agonies of the patient, or until the urine begins to flow by the side of the bougie, and of this he says : " This manner of attacking retention is lengthy, not brilliant, and rather unsurgical, but it is sure, free from danger, and gives a sufficiently complete result, as, in a short time, pain ceases and the bladder becomes completely emptied ". As M. Phillips was probably unsurpassed in his powers of treating strictures, succeeding in some cases where Nélaton had failed, this little manœuvre of his should not be forgotten.

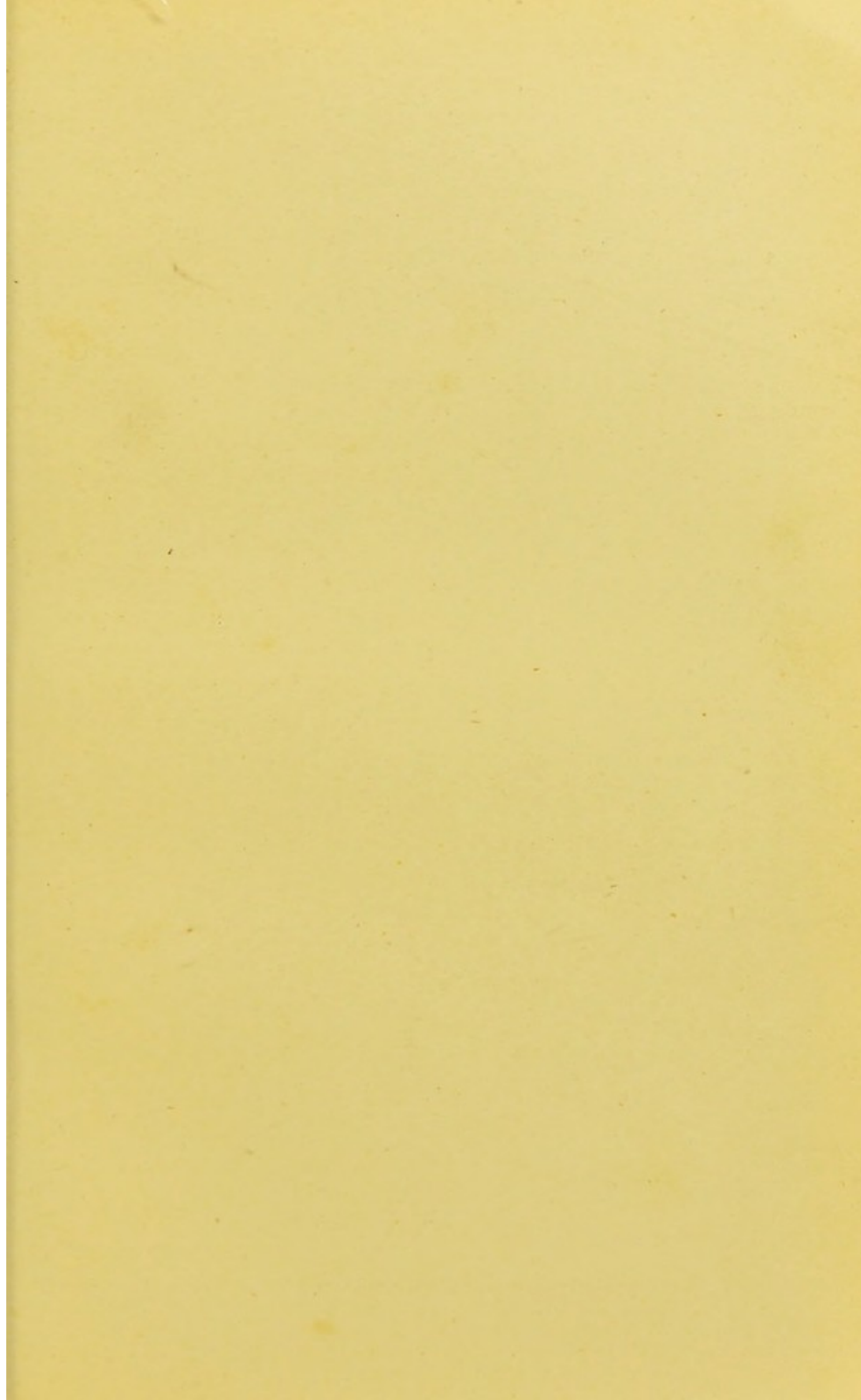
Filiform bougies may be utilised in other ways in the treatment of stricture, but, for the present, I confine my remarks to their use in retention of urine, and I think that I have said enough to show that they are extremely useful, and I would just say finally that I have no instrument in my possession that I prize so highly as the *bougie conductrice*, for it has saved me many weary and anxious moments, and has never failed me in any case of retention due to stricture of the urethra.

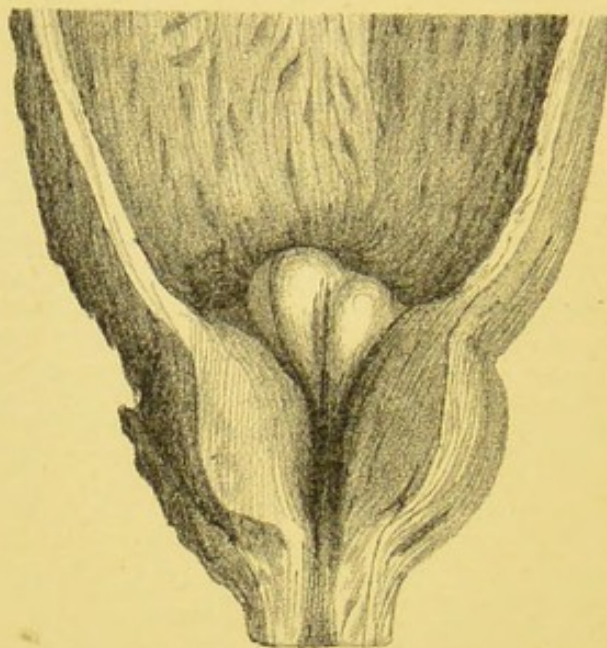
So far I have not said anything of the use of the urethroscope, and this omission is not due to a want of the appreciation of the light it may shed upon, and the assistance it may render in, a case of stricture, but simply because it must, for the present at least, be regarded as a luxury belonging to the specialist, and not likely to be found in the hands of an ordinary general practitioner.

Nor have I mentioned anæsthesia, for, if you adopt the measures I have advised you will find general anæsthesia totally unnecessary, but the topical application of cocaine, especially when the urethra is irritable and the patient sensitive, will prove extremely useful. It may be used as an ointment with which to coat the instrument, or what is decidedly more effectual, as an injection applied by a suitable syringe, or what answers extremely well, a few drops of a twenty per cent. aqueous solution may be dropped into the passage by means of an ordinary glass pipette a few minutes before instrumentation is commenced.

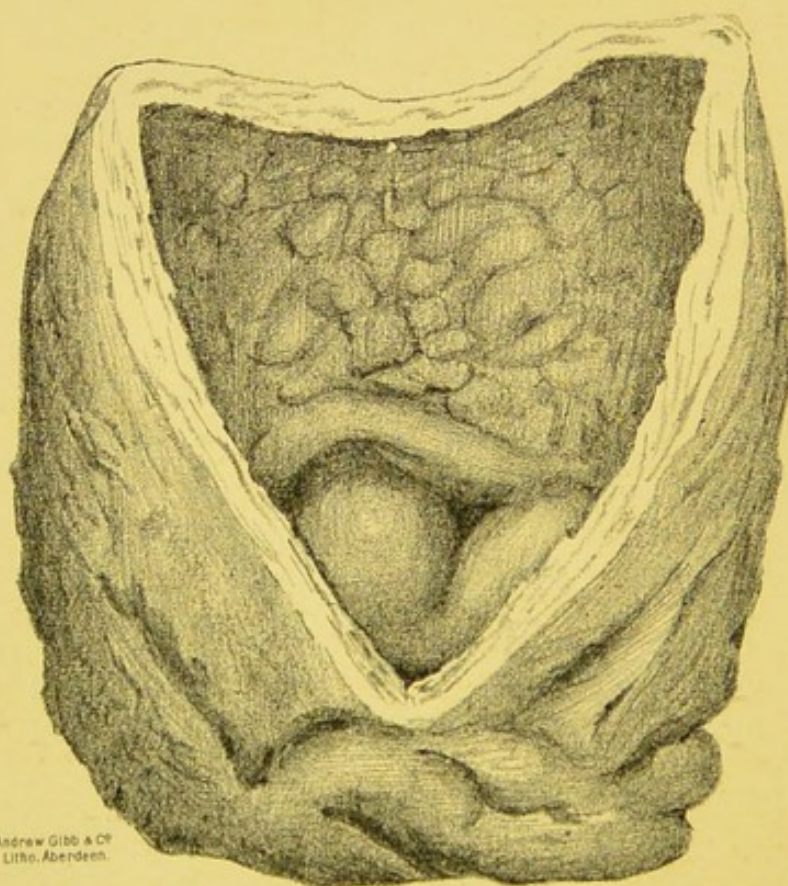
Should you utterly fail to reach the bladder *per vias naturales*, then various courses are open to you, but I have no hesitation in saying which you should choose, for aspiration above the symphysis pubis is undoubtedly the safest, simplest and best plan. It can be very readily performed by inserting the needle of an aspirator into the linea alba half an inch above the symphysis. This procedure will, of course, still render treatment of the stricture necessary, but it has been proved that if strictures be left "fallow" for a few days, they will be found, at the end of that period, to be much more amenable to instrumental measures than when they are being constantly irritated by attempts to pass instruments and by the futile efforts of the patient to urinate.

Aspiration of the bladder is, however, an operation which you will, I hope, have but little call to perform, and if you will follow the suggestions I have offered, you will be able to erase the word impermeable, as applied to stricture of the urethra, from your vocabulary.





*Median Centric hypertrophy of Prostate, with enlargement of lateral lobes,
From a preparation in the Surgical Museum, University of Aberdeen.*



Andrew Gibb & Co
Litho. Aberdeen.

*Enlarged Prostate, Bladder opened from behind. Lateral lobes much hypertrophied pushing up fold in front with
urethral opening between them. From a Specimen in the Aberdeen Royal Infirmary.*

RETENTION FROM ENLARGED PROSTATE.

Prostatic retention is exceedingly common. Sir Benjamin Brodie said: "When the hair becomes grey and scanty, the prostate gland usually, I might say invariably, becomes increased in size;" this is, however, an exaggerated statement, as many old men have perfectly normal prostates, but it has been computed that, of those who live over 55 years, one third are the subjects of enlarged prostates, and one man in ten is so affected by bladder troubles arising from prostatic overgrowth as to some time require instrumental assistance. The enlargement may consist in growth of one or both lateral lobes, or in the development of the so-called middle lobe, or in a combination of both. The third lobe constitutes the chief cause of urinary difficulty, but the lateral lobes contribute to the alterations produced on the contour of the urethra, for their enlargement leads to a considerable increase in the length of the prostatic urethra, to an increase of its antero-posterior diameter, and to a diminution of its lateral or transverse. If the enlargement is asymmetrical the route to the bladder will be circuitous. The median hypertrophy may assume various forms; it may be, as in the specimen now shown, pyriform in shape and jut into the bladder as it does here, blocking up the passage almost completely, or it may be oval or rounded, or in the form of a bar at the neck of the bladder, and these changes must, of necessity, lead more or less to alterations in the direction of the prostatic urethra. Obstructive hypertrophy of the prostate leads to changes in the bladder, its walls become hypertrophied in its efforts to overcome the obstruction at its mouth, but this hypertrophy

does not bring with it increased contractile power, for its walls are inflamed and less powerful so that the cavity is never properly emptied, the muscular fibres at its base being unable to raise the vesical pouch above the level of the dam at its mouth, and a gradually increasing amount of urine is left in this *bas fond* after each act of micturition. Dilatation of the bladder, sometimes to an enormous extent, with, not infrequently, sacculation of its walls, ensues, and ultimately, as a consequence of some act of indiscretion, such as allowing too long a period to pass without urinating, or an over-indulgence in alcohol, or sitting in a damp place, a slight additional congestion is set up which speedily ends in an attack of complete retention. This condition may end in spontaneous relief to a certain degree, by a process of dribbling, which sometimes leads the patient to believe that he is suffering from incontinence and not from retention, or he may be unable to void a single drop of urine when your assistance will be sought, and this brings us to the question of how it is to be rendered.

As in the case of stricture many different kinds of instruments are employed, but here I do not consider that it be a matter of prime importance whether a metallic or a non-metallic catheter is employed, for I regard both as suitable.

As you have had many opportunities of seeing, I generally employ a Mercier's *coudée* or elbowed catheter, *i.e.*, an ordinary catheter with its point abruptly turned up about an inch from its distal end. No instrument is better calculated to pass safely and easily in front of an enlarged middle lobe or to cross a bar more readily than this. One with a double elbow, *bicoudée*, may be used instead, but as a rule

the single-elbowed catheter will suffice. In many cases it will pass into the bladder without the slightest hitch, but sometimes it is arrested. If this happens I take another instrument with a slightly different bend—for it is a most striking fact that the very slightest difference in the direction or shape of the elbow may render a catheter suitable or the reverse for the relief of this or that case of prostatic retention—and I attempt to pass it. If I again fail, I may try a third one, for with these smooth, soft instruments the process is not painful, and I may say that failure with them is of the rarest occurrence. Were I not to succeed, then I would use a silver prostatic catheter, 13 or 14 inches long and not less than No. 12 English. When the point of the instrument reaches the prostate the handle should be well depressed between the patient's legs, and if necessary, the left forefinger may be passed into the rectum so as to be able, by upward pressure, to guide the end of the catheter in front of the obstruction into the vesical cavity.

Let me here give you one caution: never under any circumstances fasten a silver catheter into a patient's bladder, for its presence there will be fraught with most disastrous consequences. Should you have any doubts on the subject, I would advise you to pay a visit to the Pathological Museum at the University, where you will see casts of bladders taken from the bodies of patients who had been subjected to this most inhuman form of treatment, and I am assured that, even although you may have experienced considerable difficulty in getting the catheter into the bladder, you will never be tempted to leave it there, for you will see in Professor Hamilton's specimens that

the mucous membrane not only bears the distinct impression of where the catheter lay, but looks as if it had been ploughed up by the instrument, a definite furrow being left. With a Jacques's catheter of vulcanised rubber with which you may sometimes succeed in relieving prostatic retention, or in fact with any non-metallic one, the case is different, and if there are urgent reasons for placing the patient in a position to relieve himself, no great harm will accrue from its being left *in situ*, only remember that in many cases the point of the instrument will soon become encrusted with phosphates, and will thus constitute a means of vesical irritation. The instrument may be kept in position by means of the contrivance already alluded to, or by a modification of it suggested by Dr. Rust, which

can be readily made by any one from two pieces of drainage tube. You will find that it acts admirably.

The common yellow English catheters are not unsuitable for the relief of prostatic retention, but before use they should be kept for some time on an over-curved

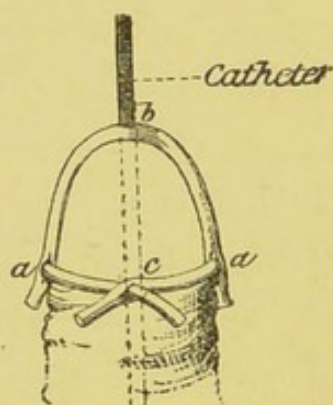


FIG. II. Method of fixing Catheter

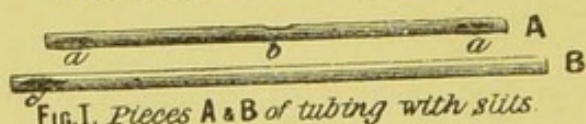


FIG. I. Pieces A & B of tubing with slits.

stylet, or one of them should be prepared at the time of use, as I do now, by dipping it in a vessel of very hot water, then curving it until it assumes an almost circular shape, and then fixing it in that position by transferring it from the

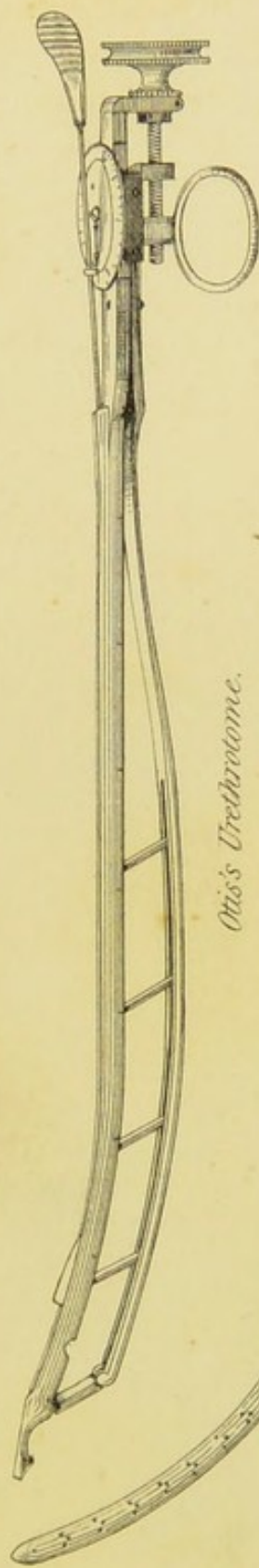
hot to very cold water. Immediately before use the catheter should be unbent, but it will still have a tendency to assume its former shape which will materially assist in its passage through the prostatic urethra. These modes of preparation were suggested by Sir Henry Thompson, and undoubtedly add much to the utility of the instruments. Many other catheters have been invented and are employed, but with those I have described you will be quite sufficiently armed for successfully combating any case of retention of urine arising from hypertrophy of the prostate gland.

Some of you saw a case recently in my wards where the patient was suffering from urgent retention, but where I avoided the use of instruments and succeeded in relieving him by other means. He was suffering from gonorrhœa, and you will remember that I directed that he should be placed in a hip bath containing water at 98° F., and that the temperature of the bath should be gradually increased to 104° F. by adding fresh hot water, and that the patient should be kept in the bath for twenty minutes if necessary, but that if he were not relieved by the end of that period that a soft catheter should be passed. A few minutes after he entered it, he passed water freely, and with but comparatively little pain. This mode of treatment may prove useful in cases of retention from other causes if you happen to be so circumstanced that you are far from home and have no instruments with you ; so you should not forget that a hot hip bath aided by morphia hypodermically, or opium by the mouth, may prove of immediate benefit to a patient suffering from inability to empty an over-distended bladder. Bear in mind, however, that no case of retention should be allowed to go

unrelieved for any length of time, and that the expedient just referred to is only to be employed in a case of emergency, for it is always better, even in a case of inflammatory retention, to pass a soft catheter than to risk the super-vention of atony of the bladder—a not improbable result of unduly delayed instrumentation.

Before bringing this lecture to a close, I wish to remind you of one fact of great practical importance on which you have many times heard me dilate, and to which I directed your special attention when speaking to you of Catheter Fever, *viz.*, when you are asked to relieve a patient who has been the subject of retention of urine arising from the presence of an enlarged prostate, and in whom catheterism is being practised for the first time, be content to draw off only part of his water, for if you act otherwise there is every probability that he will have reason to curse rather than to bless the day on which he called upon you to administer to his needs.





Otis's Urethrotome.



Prostatic Syringe.



B



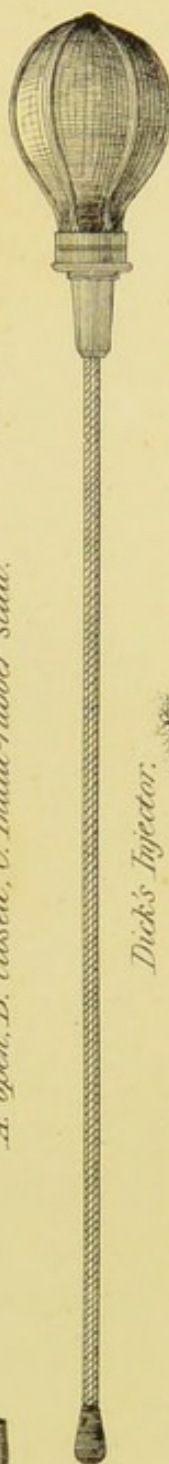
A

Urethrometer.

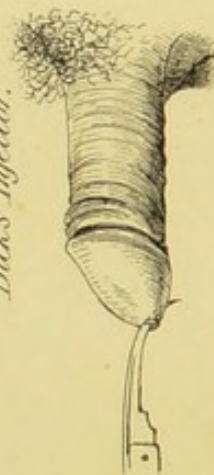
A. open, B. closed, C. India-rubber stall.



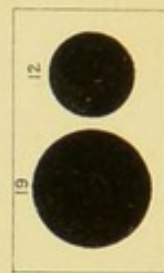
C



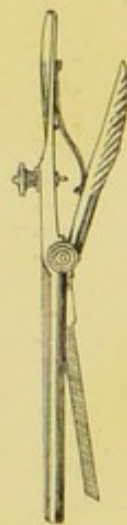
Dick's Injector.



*Division of Artificial Stricture
by curved bistoury.*



*Part of Catheter gauge
Nos. 12 & 19 English scale.*



Bistouri Caché.



Acorn-headed Bougie.

LECTURE III.

GLEET AND ITS TREATMENT.

GENTLEMEN, the patient before you presented himself in the admission-room a few days since complaining of gleet. He told us that upwards of a year ago he had contracted gonorrhœa, the symptoms of which were pretty acute, but that under treatment the discharge gradually became less and less until the whole that remained was only sufficient to furnish a morning drop at the meatus, the lips of which he usually found glued together on awakening. Notwithstanding prolonged treatment, he is now in exactly the same condition as he was many months ago ; the drop is still apparent in the morning, and after carefully squeezing the canal from behind forwards, we succeed in causing the emission of a single drop of fluid partaking more of the character of mucus than pus, which is the characteristic feature of the discharge in cases of gleet. With the exception of the presence of a few filaments, made up of pus cells cemented together by mucus, in that portion of urine passed at the commencement of the urinary act, the patient presents no other symptoms.

The history of this patient is a very common one, and the cure of such cases is only too often a matter of extreme difficulty ; and as cases of obstinate gleet are certain to come under your notice at an early period of your pro-

fessional life, I propose devoting our lecture hour to the consideration of the causes which may lead to the continuance of slight discharge after the major symptoms of venereal urethritis have disappeared ; to a demonstration of the mode of examination necessary for the discovery of any lesion which our patient may have in some part of his urethra ; and to the treatment suitable for cases of gleet.

The causes of gleet may be either constitutional or local.

In some cases we find that the patient is more in need of treatment than his urethra ; that the continuance of the discharge is due to some taint of the constitution, the patient being of the strumous, gouty, or rheumatic diathesis, or that he is anæmic, ill-fed, or given to excesses—sexual or vinous. In such cases we must rely more upon constitutional than on local measures ; we must endeavour to correct or modify the vitiated state of the system by the administration of appropriate remedies, and by the observance of all hygienic measures calculated to brace up and strengthen the vital powers. This view of the cause of prolonged gleet is only too frequently lost sight of, the whole energy of the treatment being directed to the urethra,—a course which, instead of being attended by favourable results, tends to prolong and intensify the evil it is used to combat, for excess of local treatment is a not uncommon factor in the production of slight, long-continued discharge. In proof of the correctness of the last statement, I may tell you that I have often found patients who had suffered from gleet for long, and who had been “worrying” their urethral passages with injections containing first one

and then another astringent, and who had tried all sorts of nostrums recommended by those to whom they had confided their troubles, almost completely cured by simply abstaining from all treatment for a week. It is unnecessary to enter upon the treatment required by those whose gleet is due to diatheses, but I would simply remark that in the strumous and broken down, cod-liver oil emulsion, iron, nickel, Easton's syrup, and other tonics, will be found of the greatest use, while the beneficial effects of stimulants—the use of which during the acute stage of venereal urethritis is to be absolutely avoided—are frequently most manifest.

Lee, Bumstead, and Shipley have shown that smoking is undoubtedly injurious, and tends to keep up the discharge. The use of tobacco should, therefore, be altogether proscribed, or kept within very moderate bounds.

Certain drugs are supposed to exert a specific influence upon gleet, of which the most noteworthy are cantharides and ergot; either of these may be combined with iron, and of their virtues I have no doubt. A mixture of tincture of perchloride of iron and liquid extract of ergot, although chemically incompatible, is a most valuable and successful adjunct to the treatment of gleet.

In our patient's case, however, none of the causes mentioned can be that to which the discharge owes its persistence, therefore we must look for a local source. The local causes of gleet are—1. Slight or commencing stricture; 2. Inflamed mucous patches; 3. Inflammation of the glands and follicles of the urethra; 4. Follicular prostatitis. There is a 5th, *viz.*, Congestion of the prostate; but it, as a rule, is

not of venereal origin, but results from masturbation, and therefore does not concern us to-day. Before, however, examining our patient's urethra for the purpose of ascertaining to what his gleet is due, let me say a few words about each of the four causes mentioned :—

I. *Slight or Commencing Stricture*.—This is a very common cause of gleet, and gleet is also a very common symptom of stricture, for as Otis, an American surgeon, says: "Gleet is the signal which nature hangs out to call attention to the fact that the urethra is strictured in some part of its course". The gleet from stricture comes from that part of the canal lying directly behind the contraction, where inflammation to a greater or lesser degree is always present, and the discharge must continue, and will increase so long as the stricture remains untreated.

II. *Inflamed Mucous Patches*.—The mucous membrane lining the urethra, instead of returning to its normal condition after the cessation of the acute symptoms of inflammation, may present, when viewed with the endoscope, circumscribed patches in which inflammatory changes are still taking place, and the surface instead of being glistening presents what Mr. Hurry Fenwick has well described as a lack-lustre appearance. These patches may be either of a dark or purplish-red colour, surrounded by normal mucous membrane, or pale yellow or greyish with velvety, uneven papillary surfaces: in the former congestion is the best marked feature, in the latter induration predominates. Their most common seats are the bulb of the urethra and

the fossa navicularis. Superficial erosions are also met with, and sometimes a patch of white, sodden epithelium—the nacreous patch of Fenwick—is observed in the deeper urethra.

III. *Inflammation of the glands and follicles* may be, and often is, a cause of gleet, and a very intractable cause too, but in many cases, inflammation of these structures is so closely connected with inflamed mucous patches that the treatment of the one will be sufficient for both. But gleet may be due to diseased urethral glands *per se*, and where this is the case urethroscopic examination will reveal enlarged glands with widely opened mouths, with a surrounding halo of redness, ranging from pink to purple, or the glands will be swollen and distended with secretion, which escapes from time to time and, as has been pointed out by Mr. Fenwick, probably accounts for the cases of intermittent gleet which are not uncommon. For the recognition and treatment of this cause of gleet the urethroscope is invaluable, for by its aid we are enabled to apply caustic directly to the affected point. The lacuna magna, which, as you doubtless know, lies on the roof of the urethra in the fossa navicularis, is too large to become obliterated or sealed by inflammation, as often happens in the case of the lesser follicles, and it frequently remains inflamed long after inflammation has ceased elsewhere. The mere mention of the fact that this is a not very uncommon cause of gleet, will lead you in the right direction when you are at a loss to find a satisfactory explanation of prolonged discharge. Division of the

offending structure, which can be readily effected, will speedily put an end to its interference with the cure of the affection.

IV. *Follicular prostatitis* is the result of the spread of gonorrhœal inflammation backwards, and although with the exception of *very* slight discharge, it is, as a rule, symptomless, it is unfortunately very rebellious to treatment. In some exceptional cases, where the deeper parts of the gland are affected, the patients present symptoms resembling those of vesical calculus, *viz.*, pain and heat along the whole urethra, most marked at the neck of the bladder after urination, pain at the point of the penis, a desire to squeeze the prepuce, and a feeling of dragging in the perineum. The urinary act is often interrupted, and is followed by dribbling, and upon rectal examination acute pain is complained of. The history and the symptoms elicited during rectal examination are diagnostic.

Having now discussed the different lesions on which gleet may depend, let us next endeavour to ascertain to which of them we may refer our patient's case. Two methods of examination are open to us, *viz.*, the use of the urethroscope, and urethral exploration by means of a bougie, and as the latter is still the method upon which those who do not devote special attention to the treatment of urethral diseases must rely, and as I can readily demonstrate this mode to the whole class, I shall take it first and return to the urethroscope a little later.

In the instrument which I show you we possess a sure and certain guide to correct diagnosis. It is what is known

as an acorn bougie, the name being derived from the appearance presented by its head, which bears a close resemblance to an acorn. The shaft is long, slender, and flexible, and bears on its distal extremity the bulbous body alluded to ; it is graduated from heel to point, so that a glance at the figures marked on the shaft shows how far the instrument has passed. By the aid of this instrument we are enabled to prove the presence and situation of stricture, not only of well-marked contraction, but of slight thickenings of the mucous membrane, or commencing stricture ; and by using acorn bougies of different sizes, to ascertain the calibre and length of the obstruction ; to decide whether the urethra is, or is not, the seat of inflamed mucous patches, and when present, to show their position, character, and extent ; and to determine in any given case whether the prostate is involved in the production of the gleet. The value of such an instrument in cases of long-standing discharge can, therefore, be hardly over-estimated.

In exploring a urethra with this instrument you must bear in mind the different local causes of gleet, then take one the size of whose head corresponds to that of the meatus, render it aseptic and oil it and pass it gently along the urethra. If a stricture be present the instrument will be arrested in its course towards the bladder ; if an inflamed mucous patch, then the patient will complain of pain while the acorn rests on that part of the urethra which is the seat of inflammation, and the pain will cease as soon as the bulbous head has reached healthy mucous membrane, for the shaft, being of so much smaller size than the head, will not press upon the affected part,

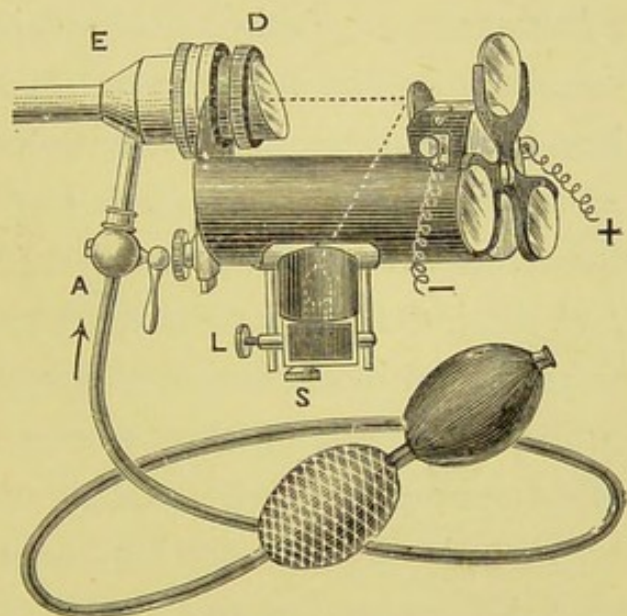
therefore the symptom pain will not be elicited. If the prostate be involved, the instrument will pass without pain or obstruction until it is about to enter the membranous portion of the urethra, when it will perhaps be arrested by spasm ; and when the head of the bougie is passing through the prostatic urethra, acute pain will be complained of, which will cease when the head of the instrument enters the bladder.

I shall now pass a full-sized acorn bougie on our patient, and you will have an opportunity of observing its behaviour (*demonstration*).

You saw that the instrument passed for a considerable distance without any complaint on the part of the patient, but that when its head rested in the region of the bulb he complained of pain ; that, when it was pushed a little onwards, but short of entering the bladder, he said that pain had ceased ; that its passage through the prostatic urethra was painless ; and that, during the slow withdrawal of the instrument, its presence occasioned pain at the exact spot where it had previously done so during its introduction. I conclude, therefore, that the patient is suffering from an inflamed mucous patch at the bulb, and that the discharge is due to that lesion, and I believe that the patch belongs to the congested and not to the indurated variety, as the instrument seemed to pass smoothly when in contact with the affected surface, and did not impart a feeling of roughness or unevenness to my hand, which it would have done had the patch been rough and indurated. I have not the slightest doubt that the diagnosis arrived at is absolutely correct, and that the acorn bougie has given us all the

information we require. Cases will, however, be occasionally encountered when the only means of exact diagnosis will be found in the use of the urethroscope, and as that instrument is, with its modern improvements, now no longer the scientific toy to which Sir Henry Thompson alluded when he said: "If a man has a tolerably practised hand, and a fair share of intelligence, I do not think that he will gain very much from the use of the endoscope; if he has not, I do not think that he will gain anything at all," but an instrument of the highest value, both as an aid to diagnosis and treatment, I desire to demonstrate as shortly as may be its mode of use.

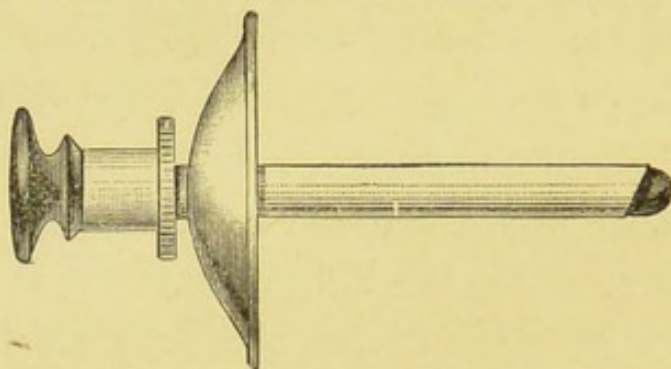
The electric aero-urethroscope of Von Antal which I now show you is the most perfect instrument of the kind yet invented. It is so constructed that air can be forced into the urethra, thus dilating it, and, therefore, affording a very much wider and more distinct view than was before possible.



E. Urethral tube.
D. Removable diaphragm.
A. Inflation tube.
L and S. Cell for lamp and detachment screws.
X. Wires from battery.

Its use is not attended by any real difficulty; you have simply to pass a urethral tube of suitable size into the passage so that the glans penis is well into the cap provided for its reception. Then withdraw the plug, and attach

the reflecting part of the instrument to the tube, then inject by squeezing the india-rubber bag and turn the stop-cock so as to retain the air within the canal. If you now look through the glass diaphragm a most satisfactory view



Urethral tube with plug.

of the urethra will be obtained. By using one of the lenses, additional magnifying power will, of course, be at your command. The nearer parts of the urethra will be brought into view during the slow withdrawal of the tube. When a diseased patch or gland has been discovered topical treatment can be readily applied by removing the diaphragm and passing a slender forceps armed with a pellet of cotton wool soaked in a solution of the required medicament, or a probe coated with melted nitrate of silver may be inserted into the open mouths of the glands.

For the deeper urethra, bent tubes with posteriorly placed fenestra are used, and, of course, inflation is not practised.

Let us now consider what methods of treatment may be followed for the cure of this case. A considerable number of different modes have been proposed. I shall, however, mention only a few, but sufficient for the relief of any cause of gleet due to the presence of inflamed mucous patch congested or indurated.

The first means to which I shall allude is, so far as I have seen, the best of all ; it is the passage once or twice a week of a cold, well-oiled, metallic bougie combined with the continued internal administration of cantharides or ergot.

According to Van Buren, the good effects resulting from the use of such an instrument may be ascribed to " the sensibility of the canal becoming blunted by contact with the instrument, its irritability being overcome by the slight distension to which it is subjected, while the tonic effect of the cold metal is also probably a factor in producing the good effect ".

Whatever may be the correct explanation of its mode of action, the good effects attending the use of a metallic bougie are undoubted ; but if you adopt this method you must bear one fact in mind—the instrument must be of sufficient size, for unless you employ as large a bougie as the meatus will admit, almost certain failure will be the result. You must not conclude that, because a No. 12 (English scale) bougie is the largest size of bougie supplied by instrument-makers in sets of bougies, No. 12 is the maximum capacity of the male urethra ; if you do, you will fall into a grievous error. I here show you two instruments—No. 12 and No. 19—and I may tell you that the latter, elephantine though it may seem, is in reality much nearer the average size of the human male urethra, than the former. Now, if our object be the complete distension of the urethral walls—which I hold that it should be—it can only be attained by the introduction of as large an instrument as the passage will admit ; if we employ a No. 12 when the capacity of the urethra is No. 20, little, probably

no good will result from the treatment, whereas much benefit would accrue from the use of an instrument of sufficient relative size.

If the relative size of the urethra and the instruments employed has any bearing on the treatment of gleet from mucous patches, of what infinite importance must this be when considered in relation to gleet from stricture! For example, take a patient suffering from chronic discharge arising from slight urethral stricture; you pass say a No. 12 and encounter no obstacle; you then say, "There is no stricture here," but your conclusion may be utterly fallacious, for that man's urethra may be strictured, and the degree of contraction may be sufficient not only to prolong gleet, but to encroach upon the calibre of his canal to a not inconsiderable extent. The capacity of his urethra may be, say 19—a not uncommon one—No. 12 passes, but No. 13 is arrested, the degree of stricture is represented by the difference between Nos. 12 and 19, an amount of contraction of no mean importance, the presence of which will certainly cause the continuance of discharge. Without going further into the matter, I would simply impress upon you the axiom, that, in treating gleet arising from inflamed mucous patches or stricture by means of a bougie, you should employ in each individual case as large an instrument as will pass, and that you should not rest content until you are able to pass into the bladder as large an instrument as the meatus will admit, for the meatus being the narrowest part of the canal, any instrument passing through it should traverse the whole urethra with ease. If the instrument is arrested in its course the

obstacle is not a natural, but a pathological one, whose removal is called for.

I shall now pass on to another mode of treatment, which you will find a useful one either when used alone or in combination with that just mentioned. It is the topical application of astringents, which may be carried out in various ways, *e.g.*, by solutions applied by means of a deep urethral injector, by soluble bougies, or by a solid bougie coated with an astringent ointment. In applying an astringent solution you make use of such an instrument as the one I now show you—Dick's injector—which consists of a long tube ending in a bulbous point, perforated by numerous openings; the lotion is contained in this india-rubber bag, which, after being charged, is fitted on to the proximal extremity of the instrument, and by compressing it the fluid is impelled along the tube, from the point of which it issues in the form of spray. Numerous other instruments have been suggested, such as this silver one, but the injector just described is cheap, simple, and effective. Nitrate of silver is the astringent most commonly employed, the strength of the solution varying from ten to thirty grains to the ounce of distilled water, according to the effect desired and the character of the lesion, the weaker being used where congestion predominates, the stronger where induration prevails.

Before using the injector the patient should make water, the instrument is then passed down the urethra, so that the perforated portion of the tube may lie in contact with the part of the canal where the acorn bougie has previously shown the presence of inflamed mucous membrane. The

injection should now be made, and the instrument withdrawn. The patient should, if possible, retain his water for some hours afterwards, and take as much rest as possible, while alkaline and diluent drinks may be prescribed to lessen the acidity of his urine. During the next few days the discharge will increase in quantity and in purulence, but this comparatively copious discharge will soon disappear, and with it the pre-existing gleet. Not unfrequently, however, a second injection is called for, and in some cases the administration of antibleorrhagic remedies will prove of service. Soluble bougies, containing astringents, are frequently useful; they are passed into the canal, where they dissolve, and are kept *in situ* by some retentive appliance fastened round the glans. If you make use of them, direct the patient to pass one each night at bedtime. There is, however, a simpler mode than either of those alluded to, and one from which I have got the best results, and as I propose using it in this case you will have an opportunity of seeing how to apply an astringent without the aid of any special instrument. I have here an ordinary No. 8 metallic bougie, the extremity of which I have coated with an ointment consisting of sulphate of copper, wax, and lard; its exact composition you may see on the board, *viz.*, R̄ Cupri sulphatis, adipis āā ʒiss., ceræ albæ ʒi.

This ointment, on account of the large proportion of wax which it contains, is hard, and requires a considerable degree of heat to dissolve it, therefore if the bougie be passed quickly through the unaffected parts of the urethra it will reach the affected part without the ointment being rubbed off. Before using it it should be well

oiled, and you see that, although the point is covered with ointment, it takes the oil on well. Now take it and pass it thus (*demonstration*) to the point where we discovered the patch; we shall let it rest there for a few minutes, and then withdraw it, when the affected part will be left with an astringent coating derived from the bougie. You may, of course, employ other astringents in a like manner, but the one I have made use of, the formula for which I found in Bumstead's work on the Venereal, answers admirably, and leaves little to be desired. Should your experience be at all similar to mine, you will find that this mode of applying astringents, conjoined with the occasional passage of a large metallic bougie, is a most trustworthy and successful means of allaying the symptoms to which the mucous patches give rise. Another somewhat similar method consists in the use of astringent and antiseptic ointments ejected from such a collapsible metal tube as I now show you. A catheter, which is screwed on to the



tube, is passed well into the urethra, and by squeezing the tube the passage becomes coated with the unctuous substance, and this can be retained by placing a small piece of lint over the meatal orifice, or after filling the canal with ointment in the way just mentioned, a steel bougie of large size may be passed in order to thoroughly dilate the passage and to squeeze the ointment into the diseased patches, and the glands and follicles of the part.

These tubes, which can be filled with any kind of ointment desired, and are made by Sumner & Co., Liverpool, are of undoubted utility.

Mr. Reginald Harrison has spoken very favourably of the frequent and thorough cleansing of the urethra by means of copious weak antiseptic solutions applied through a small soft rubber catheter attached to a Higginson's syringe, and I have myself frequently found this mode of treatment advantageous.

The only other method of treatment to which I shall direct your attention is that known as isolation, which, although long known and practised, has received but little notice in this country in recent years, but which has lately been strongly upheld by Professor Chiene of Edinburgh.

Isolation is based upon the fact that, if friction of inflamed surfaces can be prevented, the healing process will be accelerated; therefore if we can in any way apply a protective covering to an inflamed mucous patch, friction will be overcome, and the excoriation will take on healthy action. To this end various injections containing insoluble powders, such as calamine and bismuth, have been employed, a coating of the powder being left upon the affected surface. Such injections often did good, and were much thought of by Ricord, but little lumps of the substance employed, collecting in the canal, created irritation, and although much used by Ricord and other French surgeons, this mode has not found favour in Britain. A substance has, however, been introduced which is not only free from the drawbacks referred to, but which possesses advantages rendering it superior to any of the previously

used medicaments. It is kaolin or clay earth, and the mode of using it is this : Make, with water, or oil, as thick a paste as will run ; fill the urethra with this by means of a common urethral syringe, then place a little bit of lint over the meatus, and retain it there. The injection is to be allowed to remain within the urethra until the next urinary act, after which the process is to be repeated, and so on. The result is, that friction of the affected surface is absolutely prevented, healing takes place, and the discharge ceases.

Treatment of Gleet arising from Stricture.—From what has been said cursorily you will understand that, in cases of gleet due to the presence of stricture, dilatation by means of metallic bougies is the method of treatment to be adopted, but there are cases where this fails to effect a cure, and where some other mode must therefore be adopted. In connection with this point I would now bring before you the views of an eminent American surgeon—Dr. Fessenden Otis—which differ in many points from those that have hitherto obtained regarding gleet and its treatment, and which have attracted not a little attention during the last few years. One of his cardinal tenets is that “complete freedom from obstruction in the urethra is necessary to completeness of function, therefore the slightest narrowing at once assumes a pathological importance. Such slight narrowings are exceedingly common, for any inflammation, set up by any cause, which dips below the mucous membrane lining the urethra occasions, of necessity, an aggregation of plastic connective-tissue material which, becoming organised in the sub-mucous structures, is at once established as a

point of obstruction in the normal urethral canal. This obstruction or constriction, however slight it may be, increases friction ; increased friction causes irritation, and continued irritation of the mucous membrane often causes, and always prolongs, a mucous or muco-purulent discharge." Gleet may thus be the result of the slightest encroachment upon the normal urethral calibre, and must continue until the cause of the increased friction is removed, and Otis holds that the only certain mode of permanently getting rid of the discharge is to divide the minute bands by which the urethra is encircled after it has been dilated as fully as possible by the repeated use of bougies. Most surgeons rest content with the first part of the treatment, *viz.*, full dilatation, but all allow that as stricture-tissue is cicatricial-tissue, which is, as you know, eminently contractile, there is a great probability of recontraction taking place, but Otis states that this recontraction may be absolutely prevented, and the absorption of the tissue forming the stricture ensured by resorting to the second step of the mode of treatment suggested by him, *viz.*, division of the band or bands surrounding the urethra by means of an instrument invented by him. Otis does not claim that the division of the stricture always cures the gleet, for if the inflammation has been long-continued, it may have spread to the continuous mucous membrane of the urethral lacunæ and sinuses, and may persist indefinitely, but he does claim that, as gleet as a rule depends on stricture, and cannot possibly be disposed of so long as the stricture remains, its division is the first and most rational mode of remedying the evil, and that, in the great majority of cases, after that

has been accomplished, the gleet will cease without any other treatment. He found that no method had been devised by which the normal calibre of the urethra could be accurately determined, and that it was therefore often impossible to ascertain whether incipient stricture existed or not; he accordingly set to work, and devised a most ingenious instrument by which the normal calibre of any individual urethra could be determined, and by which the presence of the slightest contraction could be demonstrated. This instrument is called the urethrometer. It consists of a slender cannula marked in inches, at the end of which a set of steel springs can be expanded into a bulb by advancing a stem within the cannula. This movement is obtained by turning a screw at the handle, and the amount of expansion is shown by an index on a dial plate. When closed the distal end of the instrument measures from 10 to 12 millimetres in circumference, when fully expanded it measures 45 millimetres, or about two and a half times the size of a No. 12 English catheter, which was for long regarded as the maximum capacity of the urethra. When we desire to measure a urethra with the urethrometer, a thin india-rubber shield is drawn over the springs to protect the walls of the passage from injury, and to prevent the access of secretions to the interior of the instrument. The urethrometer is then introduced closed as far as the bulb of the urethra, and gradually expanded until the patient announces that he has a sense of fulness where the bulb of the instrument rests; it must not, however, be distended to such a degree as to impede its free movement within the urethra, but must be capable of being freely

moved back and fro. By looking at the index we thus become acquainted with the size of the canal at the bulbous part of the urethra. The urethrometer is then gently withdrawn, the expanding part being enlarged or diminished as tight places or slack ones are reached, and the several dimensions are noted by observing the index, and the distance of contraction from the meatus determined by reference to the graduated handle. Any diminution from the widest measurement Otis regards as a stricture and therefore abnormal, and he states that the cure of the gleet can only be attained by restoring the canal to its original size. Those of you who are familiar with the opinions generally held regarding the measurements of the different portions of the urethra will at once be inclined to regard Otis's conclusions as fallacious, for anatomists teach that the normal urethra varies in width at different points—that it is widest at the bulb, then gradually narrows, then expands at the fossa navicularis and again becomes narrow at the meatus. If such be the case, then, you would undoubtedly be right in objecting to Otis's conclusion, but he holds that the normal urethra is of equal calibre throughout, therefore his mode of measurement must be absolutely correct, and this, he says, he has proved by examining several hundred cases. In connection with the measurement of the urethra, I may tell you that Otis states that "the capacity of the urethra always bears a constant relation to the size of the individual penis, which latter varies greatly in different individuals". He found in the course of a laborious and long-continued investigation that the flaccid penis measures from three to four and a

half inches in circumference, and that the capacity of the urethra varies from thirty to forty millimetres, and that an increase of a quarter of an inch in the circumference of the penis implies two degrees increase for the capacity of its urethral canal. For example, if the circumference of the penis be three inches, the calibre of the urethra is thirty millimetres; if it measure three inches and a quarter, then the urethral passage will admit No. 32 (French scale), and so on. Whether Otis's conclusions regarding the relative size of the organ and its passage are absolutely correct or not—and I may say that my experience is rather in favour of his views—there can be no doubt that “the specially distinguishing feature of man,” as Sir Henry Thompson terms the penis, and the canal by which it is permeated differ, so far as size is concerned, in different individuals as widely as mouths and noses do, and this fact, which is one of no small moment, should be kept in constant remembrance. It would be well that you should also bear in mind Otis's conclusion, to this extent at any rate, *viz.*, that if the penis be large, the urethra may, and probably will bear a proportionate size, for this may guide you aright while it cannot possibly mislead you.

I now come to speak of his mode of treating incipient stricture.

The instrument he uses is one in which dilatation and division are combined, the dilatation being mainly useful in enabling us to apply the edge of the blade with certainty to the structures which we intend to divide, and thus protect, as far as possible, the healthy portions of the canal from injury. The instrument is constructed on the principle

of the ordinary parallel rule, the bars being separated by means of a screw apparatus at the handle, and the amount of separation being registered on a dial at the proximal extremity of the urethrotome. A knife, two millimetres in breadth, runs in a groove on the upper bar of the instrument, and a sheath is placed at the distal extremity of the urethrotome for its reception. The size of the urethra having been determined by means of the urethrometer, and the existence of a stricture and its situation having been ascertained by the use of a bulbous sound, the urethrotome is introduced and passed beyond the strictured point, the screw at the handle is turned dilating the instrument up to, and a millimetre or two beyond, the normal calibre, in order to make the stricture completely salient, and then by drawing the blade forward the contractions are completely sundered. The knife is then resheathed and the instrument withdrawn. An acorn bougie of a size corresponding to the previously ascertained calibre of the urethra is then passed for the purpose of insuring that every fibre of the stricture tissue has been divided, for if the slightest vestige be allowed to remain, recontraction will be the inevitable result.

The after treatment consists in passing a full-sized steel bougie every day, or every other day, until the healing process is complete.

The result of this treatment has been, according to Otis, complete and permanent recovery, complete absorption of stricture tissue in every case where the stricture has been thoroughly divided.

Such then is a brief account of Dr. Otis's views so far as gleet is concerned, and brilliant results have undoubtedly

been obtained in his hands, but for my own part I still feel inclined to abide by the rule by which I have hitherto been guided—that full dilatation is all that is required ; but, were I to come across a case which resisted this mode of treatment, and where the gleet evidently depended on stricture, I would not hesitate to employ the dilating urethrotome, or to divide the stricture with a slender knife aided by electric illumination of the urethra.

Before leaving this part of our subject, I must advert to one point which I have not yet noticed, *viz.*, Orificial Stricture. Stricture of the meatus may be very easily overlooked, and its neglect may deceive in more ways than one. For example, if you adopt the rule I have suggested regarding dilatation, *viz.*, that you should not rest content without the introduction of as large a bougie as the meatus will admit, but that that should satisfy you—if, I say, you adopt this rule, and you meet with a case where the *meatus* is abnormally contracted, and you pass as large an instrument as it will admit, and find that it slides readily into the bladder, then you would naturally consider yourselves entitled to believe that the urethra was not the seat of stricture, and you would forthwith take another plan for the purpose of discovering the source of the discharge, and still obtain only negative evidence, and so on until you had exhausted all the known causes of gleet, and still you would be no wiser. This would undoubtedly be the result were you not acquainted with the fact that there may be a stricture at the very mouth of the urethral canal, therefore it is a wise precaution to examine the meatus in every case of protracted gleet before looking

further for its probable cause ; and if you find a cicatrix involving the orifice, or if you can demonstrate, by the use of a probe, what Van Buren calls a "distinct pocket" behind the superior, or, more commonly, the inferior commissure of the meatus, then you may rest assured that there is unnatural narrowing at this point, and that it is the cause of the discharge. The treatment proper for orificial stricture is division by a *bistouri caché*, or in the absence of that instrument by a common sharp-pointed curved bistoury, the sharp point being protected by wax during its insertion. After the operation care should be taken to prevent union of the edges of the wound by separating them every day until their surfaces have healed.

Treatment of Follicular Prostatitis.—The treatment of gleet from an inflamed prostate varies with the urgency of the symptoms, but in all the degrees urethral hygiene must be strictly enforced. All things tending to cause physiological congestion of the prostate, such as lascivious thoughts and sexual intercourse, must be avoided, and the use of intoxicating liquors eschewed. The diet should be light but nourishing, and a daily evacuation of the bowels should be insured, but purgation avoided. If there is much pain and frequent micturition, local depletion by means of leeches applied to the perineum may be found necessary, an anodyne suppository should be passed into the rectum at bed-time, and alkaline and mucilaginous drinks should be freely partaken of. When the prostatic tenderness has disappeared prolonged immersion in a cold hip bath before retiring to rest will be found of the greatest benefit. Counter-irritation is

relied upon by many as the most efficacious of all the measures at our command in the treatment of prostatic gleet, and it may be carried out in various ways. Berkeley Hill recommends painting the perineum, the genito-crural folds, and neighbouring parts of the thighs with caustic solution of iodine, and keeping the patient in bed for a few days; Van Buren applies cantharideal collodion to one side of the perineum and confines the patient to bed, and so soon as the blistered surface has healed he repeats the process on the other side. If you adopt the latter method the scrotum must be bound up so as to prevent its being blistered, and the parts round the anus should be smeared with ointment to preserve them from irritation.

After all inflammation of the substance of the prostate has disappeared, and when relaxation of the mucous membrane alone remains, the injection of a solution of nitrate of silver—five or ten grains to an ounce of water—or of glycerine of tannic acid, applied by a deep urethral injector will prove of service, or an ointment containing nitrate of silver may be readily and surely applied to the prostatic urethra by means of Mr. Whitehead's instrument, which is an ingenious and useful one (*see plate 2*). For using it the ointment is applied to the twisted part of the catheter, which is then covered with the shield, and the instrument is passed in the usual way. An escape of urine through the catheter will announce its having reached the bladder, and if it is kept exactly in that position and the shield withdrawn the ointment will be brought into direct contact with the prostatic portion of the urethra. The shield should then be reapplied and the instrument withdrawn.

Astringents thus applied, and the occasional passage of a cold metallic bougie, will bring this troublesome affection to a satisfactory end.

In conclusion, I may tell you that many other methods of treating gleet are in vogue, such as the use of astringent or other injections thrown up several times a day by the patient; the employment of blisters applied to the penis, the efficacy of which has been greatly extolled by Milton, who says, "that every case of clap or gleet, however obstinate, may, if uncomplicated, be cured by blistering singly or combined"; the administration of anti-blennorrhagic remedies such as cubebs, oil of sandal wood and copaiba; the use of antrophores, open wire bougies, grooved bougies, and cupped sounds; ice bougies, wax bougies rolled in alum, and ivory bougies; and almost countless devices, most of them utterly worthless. I have enumerated these methods as it is perhaps well for you to have some acquaintance with them; but, although not denying their occasional utility, I would not advocate the employment of any one of them, as, in the simple but systematic method of urethral examination recommended, and in the modes of treatment brought before you in connection with each separate lesion, you will find that you possess a rational, an easy, and a most successful combination of measures for the diagnosis and cure of chronic venereal urethritis, and one which, if properly used, will, I feel assured, render you independent of any other means yet devised for bringing this intractable affection to a satisfactory issue.

LECTURE IV.

ON VARICOCELE.

TO-DAY, gentlemen, I wish to bring before you a well-marked example of a very common disease in the person of F. G., *æt.* 27, who was admitted some days ago suffering from varicocele. He told us that he had had for long a feeling of discomfort and a sense of weight in his scrotum ; that these feelings varied in degree but never really amounted to pain, but that, as a rule, he was most affected in hot weather, and when he was constipated. He sought advice partly on account of the discomfort, but chiefly as he thought that the left testicle was becoming much smaller than its fellow. He is unable to fix the exact time at which he noticed that anything was wrong, but he knows that there has been swelling in the left side of his scrotum for several years. He never received any injury to the part. He confesses to having masturbated, and he is the subject of frequent nocturnal seminal emissions.

His scrotum is considerably enlarged, his left testicle hangs lower than normal, the veins of the cord on the left side are much more numerous than usual and are much enlarged, the enlargement extending from the testicle nearly to the external abdominal ring, and the testicle is much smaller than the right one. Things are perfectly normal on the right side.

I do not think that the youngest among you would have had any difficulty in forming a diagnosis, for with the exception of omental hernia, which I may tell you a London surgeon once mistook, and operated on, for varicocele, there is no disease at all likely to be confounded with it. The feeling imparted to the fingers by a varicocele has been well likened to that of earth worms in a bag, but as Percival Pott well observed, "He that has once felt a varicocele will not stand in need of an aid to diagnosis by comparison". The disorder is a very common one, for it has been computed that one man in ten has it to a greater or less degree, and it is one of the most fruitful sources of rejection of army recruits. Varicocele varies much in degree; in some the constituent elements of the spermatic cord are simply loose, and the veins slightly distended, in others the veins are so numerous and so large that they fill the scrotum and obscure the testicle. Here we have a fairly large swelling, somewhat pyramidal in shape, with its base attached to the testicle, while the vas deferens can be felt quite separately as a hard whip-cord-like structure. The varicocele is on the left side, which is by far the most common situation, and for this many reasons have been assigned, but before speaking of them let me lay before you some of the reasons advanced for the commonness of this disorder. And first I may mention the long column of blood contained in veins with feeble coats and comparatively imperfect valves, their dependent position and their want of support, their exposure to pressure at the ring and in the canal, or to injury from sudden and violent straining efforts. Then numerous causes tend to determine an undue supply

of blood to these organs such as excessive erections, masturbation or the frequent indulgence in erotic fancies. Such then are the causes generally enumerated as tending to the production of varicocele, and in our patient's case the last mentioned, from what he tells us, may have something to do with its origin, although a recent writer, Mr. Bennett, holds very strongly that varicocele is the cause and not the effect of sexual errors, and I cannot help thinking that there is much to be said in favour of the correctness of his views, for the radical cure of varicocele is followed by the disappearance of morbid sexual desire, and by the cessation of frequent nocturnal emissions when they have existed before operative treatment was had recourse to.

Mr. Pearce Gould believes that varicoceles "are not the result of an yielding of the veins to internal pressure, but are produced by a primary growth of venous tissue—are in fact venous hypertrophies"; while Mr. Spencer suggests that varicocele is due to a persistence of fœtal veins, which, instead of becoming obliterated, remain patent and at puberty become stimulated to undue dilatation, but this is, I think, a somewhat fanciful suggestion.

I have already alluded to the fact that the varicocele is on the left side, and as this is by far the most usual situation—of 6000 cases, more than 5000 were left-sided—there must be some special reasons assigned for this most manifest preference, and many explanations have been offered, of which the following are the chief, *viz.*: The left spermatic vein is the longer of the two, the left testis being the lower one and the vein ending at a higher point on the left than

on the right side. The blood from the left spermatic vein enters the general circulation at a disadvantage, as it joins the renal vein at a right instead of at an acute angle, as does the right spermatic vein when it reaches the vena cava, and it is supposed that it is therefore more liable to circulatory disturbances than its fellow. So strongly did Vidal de Cassis hold this view that he stated when a single right-sided varicocele was met with he believed that there must have been transposition of the viscera. This is, I think, going too far, but I believe that the anatomical reasons just alluded to are not unimportant factors in the determination of the disorder. Much weight has been assigned to the liability to pressure on the veins by a loaded sigmoid flexure of the colon, but the importance of this has, I think, been exaggerated. Our patient tells us that he is always worse when his bowels are constipated, but very many patients have assured me that constipation or the reverse made not the slightest difference to their feelings nor to the size of their varicoceles. Mr. Pearce Gould rejects the greater length of the left spermatic vein as a cause of varicocele, questions the influence of a loaded sigmoid flexure, and cites many objections to stress being laid on the difference in the ending of the right and left spermatic veins, pointing out that "such an explanation supposes a condition unique in the human body, the anatomical relations and structures of a part the direct cause of its disease; we are quite familiar with the manner in which anatomical arrangement and structure *modifies* disease, but in no other case, I believe, do we find it the *exciting cause* of disease". Bennett holds that congenital abnormality is the sole originating cause of

varicocele, and without giving my own adhesion to his views I cannot but admire their originality, and I would strongly advise you to make yourselves familiar with them when you have time to enter more fully on the study of this subject than it is possible for you to do at present.

And now, gentlemen, I desire to direct your attention most particularly to the condition of the left testicle, and I wish to discuss with you what effect, if any, varicocele has on the nutrition of the testis. None of you can have the slightest doubt that the left testicle is very much smaller than the right one, and that it is very much softer than its fellow. The patient says that these changes are recent and progressive, but we must not give too much for his observations, as patients are, as you often hear me say, untrustworthy clinical observers.

The association of a small and ill-nourished testicle with a varicocele is of such common occurrence that it must be more than a mere coincidence, and the significance of this condition has been and still is a very vexed question, some holding that the effect of a varicocele on the nutrition of the testicle is a matter of almost vital importance, while others of equal authority regard it as of not the slightest moment. To prove the correctness of this statement let me read to you some quotations from standard authorities, and first listen to what Sir James Paget says: "There are some to whom, whether through ignorance or misguidance or hypochondriasis, a varicocele is a source of misery and dismay. They look upon it as a forerunner of impotence and of wasting testicles, and I know not what besides. All such fears are groundless. Varicocele is troublesome,

because of the sense of weight which sometimes, though far from always, attends it, and which is much increased by long standing or walking. In some cases, too, the dilated veins, like varicose veins in the leg, are apt to become inflamed or very sensitive. But this, I believe, is the widest extent of the harm that a varicocele ever does. I do not believe that it ever produced wasting of a testicle, or impotence, or any such thing." This opinion is satisfactory in one way, at any rate—it is decided enough; but *audi alteram partem* before you rush to a hasty conclusion. Mr. Curling, whose work on "Diseases of the Testicle" holds the first place not only in this country, but elsewhere also, from which the following is a quotation, views matters in a different light. "Varicocele," he writes, "tends gradually to impair the nutrition and diminish the secreting powers of the testicle, hence the importance of not neglecting this complaint, though it may produce no painful symptoms. A softening and partial atrophy of the gland, coexisting with varicocele, has come under my notice in numerous instances; indeed, in nearly all the cases in which there was a decided dilatation of the spermatic veins on one side only, the testicle on that side was the smaller of the two." Now, gentlemen, it is utterly impossible to reconcile these two statements, and, mark you, both statements of honest men and accurate observers, and if we go further we find the same discrepancy. Sir Astley Cooper wrote that "varicocele should scarcely receive the title of a disease, for it produces in the greater number of cases no pain, no inconvenience, and no diminution of virile powers," and Professor Humphry of Cambridge has stated that "this

affection is rarely productive of any decidedly injurious effect upon the testicle or upon the character of its secretions," while Mr. Barwell, who has had a large experience of such cases, believes that the "testicle from which the varicocele springs is not of much use". Mr. Henry Lee has placed a case upon record in which the testicle had nearly wasted away; and Gosselin reported a case which undoubtedly proves that the testis may waste and that its functions may be destroyed by varicocele. He had a patient the veins of whose left cord were varicose, the testicle of that side being one-third smaller than that of the opposite; an attack of epididymitis supervened on the right side, and on examination of his semen no spermatozoa were found. Mr. Jonathan Hutchinson takes a totally different view of the whole matter, for he has stated that "the generative function being arrested by central nerve disease, the glands which minister to that function waste, the nutritional innervation of the testes and of their vessels is disturbed, the arteries shrink and the veins dilate". There are, however, several powerful arguments against the acceptance of this view; to one of which I shall now allude, and which seems to me to be of itself sufficient to invalidate the assumption referred to. It is the effect produced by radical treatment of varicocele upon the condition of the testis. Many surgeons have found, and I include myself among the number, that after operation the testicle gets firmer and larger, and that it may ultimately become of normal size. Mr. H. Lee met with two cases in point which seem to be conclusive: for in the one the gland of the affected side had nearly wasted away, and eleven months

after operation it was nearly of normal size ; in the other the testicle was so pendulous and loose that it hung towards the outside of the left thigh when the patient was recumbent ; some time after operation the parts had regained their usual appearance. Mr. Barwell not long since published a paper in *The Lancet*, in which he stated that in each one of the thirty-two cases where he had operated the testicle of the affected side was flabby and wasted, but "in every case the testicle had begun to resume its size and hardness soon after operation. Those that returned to observation after a year or more were found to have recovered normal condition except one. Two cases I saw after five and after seven years. The former had had, through bad habits, a double varicocele ; the testicles, previous to operation, were very small and soft ; he was pretty nearly emasculate : now the organs are firm, healthy, and of normal size. The other, seen after seven years, had become the father of two children, stated to be strong and healthy."

Mr. Bennett has found that changes in the testicle on the affected side were frequent, that softness, flabbiness and relatively smaller size were common occurrences, but he holds that diminution in size, unless as a result of accidental concomitants such as syphilis or gonorrhœa, does not exist, but that these so-called wasted testicles were instances of arrested development arising from the rapid increase of the varicoceles at the period of puberty.

The reconciliation of the divergent views held by these writers of repute is a task which I confess my inability to accomplish. The fact, however, remains, that in our present

case the varicocele is attended by atrophy of the testicle, and I may tell you that I have seen not a few similar cases, in fact, I have generally found that when the varicocele was well marked the testicle was undoubtedly more or less affected.

I have dwelt at length on the possible effect of spermatic varix on the nutrition of the testis, as it has a very important bearing on the treatment which should be adopted ; for if it be, as some hold, a condition of no moment, and one that is absolutely harmless, all operative measures for its radical cure should be at once consigned to oblivion. But if varicocele is capable of interfering with the due nourishment of so important a structure as the testicle, then we must regard radical treatment from a very different standpoint. From a not inconsiderable experience of such cases I may tell you that I am of opinion that many writers have spoken dogmatically where dogmatism is inadmissible, for although I believe that in the great majority of cases the best mode of treatment that can be prescribed is the establishment of proper sexual relations, yet I feel satisfied that cases do frequently occur for whose relief radical treatment is absolutely called for. You must therefore be guided in great measure by the extent of the disease ; and, without drawing any hard and fast line, I would suggest the following conditions as those where you should resort to operative interference after you have given palliative treatment a fair and prolonged trial :—1. If the varicocele be very large, or increasing. 2. If the testicle is atrophied. 3. If acute pain be complained of, as in our present case. 4. If the patient be disqualified from entering the public service. 5. If the

stability of his mental faculties be endangered. This last condition is not a mere fanciful one, and is met with oftener than you would expect. But let me not be misunderstood—I would not advise you to operate in those cases unless there be real and well-marked mischief; you must not permit yourselves to be led by the mere desire of a patient, who suffers from slight varicocele, for an operation; but you should explain to him as fully as necessary the comparatively innocuous nature of the affection of which he complains, and tell him that if it should increase, or be attended by any manifest ill effects upon his generative functions, you will be prepared to comply with his wishes at some future time. This expresses my meaning, with the addition of the proviso that I think you may allow yourselves greater latitude in the direction of operation in those cases where the thoughts of the patient are concentrated—often to the exclusion of all others—upon the supposed serious malady from which he is suffering, than in those where the patients are willing to accept your assurance that slight varicocele is an affection of but little significance or importance.

In connection with this another question presents itself, *viz.*, What effect has the changed condition of the testis on its usefulness? The answer is one of some difficulty, but cases have been recorded, such as Gosselin's, which would tend to show that the testicles may be useless; against this, however, I can advance the case of an old man with double varicocele, a testicle the size of a bean on the right side, while the left was hardly perceptible at all, and this condition he attributed to a severe injury

received long before his marriage, yet he was the father of nine healthy children, varying in age from 25 to 4 years.

As our patient comes under the second head his case is undoubtedly a suitable one for operation, but as he is at present unable to submit to operative proceedings, let us consider what palliative measures we may temporarily suggest. In such cases considerable comfort will be derived from the use of a well-fitting suspensory bandage, of which the best are Kettley's, Morgan's, or the old-fashioned one consisting of a triangular piece of linen attached to a waist band, all of which I now show you. Mr. Wormald suggested that instead of a suspensory bandage a portion of the redundant scrotum might be pulled through a soft metal, chamois-leather covered ring, such as I now hold in my hand, and the sides of the ring being squeezed together, the scrotal wall is thus brought nearer the varicocele and affords it adequate support.

The wearing of a well-fitting truss which affords support to the long column of venous blood above it and relieves the varicocele from hæmostatic pressure, has been found to be not only palliative, but radical, in its effects, a cure having been achieved in some cases when the treatment has been sufficiently long persevered with.

The bracing of the parts by thorough sousing with cold water, night and morning, will also prove useful ; a simple aperient when necessary should be taken ; and a tonic consisting of dilute phosphoric acid, and tincture of *nux vomica* is of undoubted service in such cases. Abstinence from alcohol, from excessive smoking, and from the indulgence

in purient thoughts is essential, and the patient must, for the present at all events, attempt to forget his sex.

The object aimed at by the radical cure is the obliteration of the veins constituting the varicocele, and in selecting a form of radical treatment one suffers from an *embarras des richesses*, for at least twenty different operations have been advocated.

I shall certainly not burden your minds with descriptions of all these, but content myself with two modes either of which would be perfectly suitable for A. B.'s case, or, in fact, for any case where operation may be considered advisable. The first one is a modification of Ricord's method and is an example of a subcutaneous operation, the other was devised by Mr. Bennett and it is an open operation.

Although I was at one time a strong advocate of the subcutaneous mode I now regard Mr. Bennett's open operation as the more generally useful, although I still not infrequently employ the other in cases of small varicoceles.

Ricord's operation as modified by myself may be readily performed as follows: Take an ordinary surgical needle with a broad point, thread it with a long loop of silver wire, knot the wire at a point distant about two inches from the eye of the needle, and twist the wire firmly from this knot to the eye. The vas deferens having been separated from the mass of veins, the needle is to be passed through the scrotal wall, between the vas and the veins, and brought out at the other side. The wire must be drawn out so far as to leave the point at which it was knotted outside the

scrotum. The needle may now be removed by slitting the wire at the eye. A blunt-pointed needle or probe, armed exactly as the needle was, is then to be inserted at the aperture of exit of the former one, passed over the opposite side of the veins, and brought out at the original point of entrance of the first needle, and the wire pulled out, and



Fig. 1: shows point where the wire should be knotted.



Fig. 2: needle completely armed.

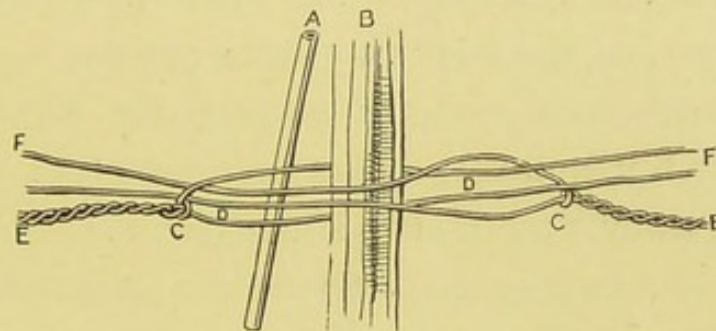


Fig. 3: wires passed but not tightened. A, vas deferens; B, veins;
C C, knots; D D, loops; E E, retractors; F F, free ends.

(Author's modification of Ricord's operation.)

the probe removed, as before. The veins now lie between two double wires, the one in front, the other behind. There are two openings in the scrotum, through each of which there project two free ends, and a twisted portion of wire which has a loop directly in front of the point where the wire was knotted. The ends of each wire are then to be passed through the corresponding loop, and pulled tightly and forcibly in opposite directions until the vessels are

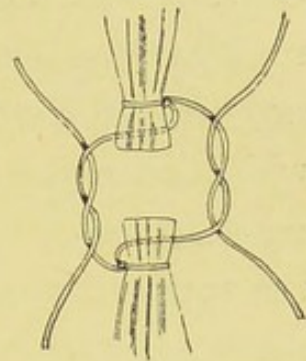
completely strangulated. Compression should be kept up by fastening the ends around some resisting body, such as Mr. Tufnell suggested, *viz.*, "a piece of watch-spring bent into an arc, the effort of which to restore itself keeps up continuous tension upon the cord". The twisted portions project on either side, and are thus available as retractors. When compression has been kept up for a sufficient length of time, the veins may be readily freed from pressure by snipping off the free ends, and making traction on the twisted ends.

I may tell you that I have frequently performed this operation without an anæsthetic and that the patients have borne it perfectly well and without much complaint.

In Bennett's operation, which I am now about to demonstrate to you, the veins after being exposed are ligatured at two points, one near the testicle, the other at some distance from it, and the intervening part of the varicocele is then cut away, and the two stumps united. In this way the cord is considerably shortened, a proceeding which affords not a little comfort to the patient and enables him to dispense with a suspensory bandage or other support.

Bennett's operation is thus performed: The patient must be anæsthetised, the vas is then separated from the veins which are made prominent, and an incision of about one inch in length is made over them. The veins should then be slightly pushed through this opening and an aneurism needle armed with a carbolised tendon ligature should be passed round the fascia and the veins within it a short distance from the testicle. The ligature should then be securely knotted. A second ligature is then applied

round the sheath of the varicocele at a point some distance from the previously placed one, the exact distance depending on the degree of morbid elongation of the cord existing in each particular instance, and a single knot is tied. The intervening portion of the varicocele is then cut away, and the knotting of the second ligature is now completed. The two stumps are next approximated and kept in contact by means of a carbolised suture passed through them, or by utilising the ligatures in the way I show you (*see diagram*). No stitches are used for the scrotal wound, but an antiseptic dressing is applied. The patient should be kept in bed for a week, and a suspender should be worn for about a month.



Such then, gentlemen, is a brief account of the more interesting and salient points suggested by A. B.'s case. Had time permitted I might have brought before you many additional considerations connected with the disorder by which he is affected, but I think that I have said enough to show you that the disease is one both of interest and importance to all who practise surgery either as specialists or as ordinary practitioners.

LECTURE V.
ON HYDROCELE.

GENTLEMEN, to-day I desire, first, to direct your attention to a case of hydrocele which presented some peculiarities not often met with, which were not a little misleading, and which led some of you astray when you were attempting to reach a correct diagnosis. I shall at the same time take the opportunity of referring to some cases which have been recently under treatment, for the purposes of comparison and instruction.

When the patient who is now before you was admitted to hospital, he was suffering from a scrotal tumour on the right side, and on examination the following symptoms were elicited, *viz.*, it was the size of a large cocoa-nut, and somewhat pyramidal in shape; on palpation it felt tense, and it was dull on percussion. There was a slight impulse on coughing, and on the application of the light test it was found to be opaque. When the tumour was grasped at its upper part the spermatic cord could not be made out, and the testicle could not be felt. When the fingers of one hand were applied to the lower aspect of the swelling, and when its upper part was lightly tapped with the fingers of the other, a distinct wave of fluid was felt. The position of the patient did not alter the appearances, and those of you who attempted to reduce the swelling by pressure

failed to accomplish it; but when pressure was applied to the upper part of the tumour an evident change in the aspect of the swelling ensued, and some of the previously ascertained symptoms disappeared. Its upper limits were now distinctly defined, there was no longer a thickened neck nor a continuation of swelling along the inguinal canal, the cord could be felt without difficulty, and while slight pressure was kept up by the finger-tips at the external abdominal ring, there was no impulse on coughing. The other signs remained unchanged. Diagnosis was now easy, for it was undoubtedly an example of hydrocele of the tunica vaginalis, complicated by reducible inguinal hernia. Let me point out to you what symptoms suggested hernia as the probable affection from which this man was suffering, and what hydrocele. He had a tumour which, according to the patient's statement,—and to this I have not yet alluded,—commenced above, and for the relief of which he had worn a truss. Now, this mode of commencement is a differential sign on which I find that students are wont to place much reliance; and it is undoubtedly correct that a hernia does commence above and a hydrocele below, and it is dwelt upon in all surgical works as both noteworthy and significant, but I have not myself found that patients, as a class, are so observant as to be able to supply trustworthy data on this point. It is, therefore, a symptom concerning which I seldom make inquiry, and when there are so many reliable signs this one, I think, can be safely disregarded. Next, the swelling extended into the inguinal canal, the cord could not be felt, there was an impulse on coughing, and the tumour was opaque. These symptoms

all suggested hernia. But the wave of fluid impinged against the finger-tips, the inability to feel the testis, and, in a minor degree, the dulness on percussion, pointed to hydrocele.

The reduction of the hernia set all doubts at rest, and I was able to say with certainty that it was a case of hydrocele of the tunica vaginalis. There was, however, one symptom which merits more than a passing notice, *viz.*, the opacity, for hydroceles are, as a rule, translucent, and this is one of the most reliable aids which we possess in making a correct diagnosis, for if it is present the character of the tumour is at once almost certainly established, but its absence, as this case shows, does not prove the converse. And although I cannot endorse in its entirety the statement of Percival Pott that "the transparency of the tumour is the most fallible and uncertain sign belonging to it, and whoever would be acquainted with this disorder must learn to distinguish it by other, and those more certain marks, or he will be apt to fall into very disgraceful as well as pernicious blunders," still you should weigh well words such as these, falling from the lips of one whose articles on hydrocele bear the impress of the master-mind whence they emanated, and who was, from his vast experience and acute powers of observation, entitled to command for them, at least, our most careful consideration.

The hydrocelic fluid is usually of a light amber or straw colour, but occasionally, from admixture with blood or from the presence of cholesterine, it is brown or brownish-yellow, or, more rarely still, it is milky white in fatty or chylous hydroceles, and these changes in colour would of

course account for the non-translucency ; and further, if there were any abnormal thickening of the sac, the tumour would be opaque on the application of light.

Notwithstanding our experience in this case and that of Pott, to which I just now referred, the light test is one which you should regard as a most valuable aid to diagnosis, for in the great majority of hydroceles it will furnish you with all the information you require ; only bear in mind that it is not absolute, and do not forget that, when it fails, you have other signs which may lead you aright. This may seem an almost unnecessary caution ; but experience has taught me that it is not so, for I have seen an opaque hydrocele cut into under the belief that a tumour of the testicle requiring excision was being dealt with ; I have seen a patient chloroformed, and all preparations made for the operation of extirpation of that organ, when, at the last moment, the surgeon was prevailed upon to make an exploratory puncture with a trocar, which speedily showed the real character of the affection to be a hydrocele with thickened walls ; and I know of a case where a surgeon was lately called on to operate for strangulated hernia when the patient was suffering from colic and hydrocele.

The translucency test may be best carried out by darkening the room, making the scrotal swelling tense, and then placing a candle, or, what is of course better, an electric lamp on one side, and looking through the scrotum from the opposite side, the left hand being so placed as to prevent the rays of light from passing across the scrotum. If the swelling be translucent a reddish glare will be presented, with a dark shadow indicating the position of the

testicle. Sometimes where there is difficulty you will find the plan you have often seen me employ useful, *viz.*, looking through a stethoscope closely applied to the scrotum while the light is held on the other side. You may ask, is every translucent scrotal swelling a hydrocele? My answer must be in the negative. The exceptions are cases of hydatids and herniæ consisting of empty bowel in very young children. Some of you had an opportunity of seeing a very puzzling case in one of my wards not long since, where the patient—a young man—was evidently suffering from strangulated inguinal hernia on which I was on the point of operating, but which I succeeded in reducing, and in it there was marked translucency. There was really no opacity, but it was *more* translucent at its circumference than at its centre.

The cause of hydrocele is still a matter of doubt, some holding that it is inflammatory, others that it is a simple passive dropsy. Many good arguments have been adduced on both sides, and it is very difficult to say which is correct. I have for many years made it a rule to examine the epididymis after tapping, and my experience has been similar to that of M. Panas who always found enlargement. Whether this thickening is in the epididymis itself or in its fibrous covering I am unable to say, as my opportunities of examining cases *post mortem* have been extremely limited. It has been alleged that this enlargement of the epididymis is only apparent and not real, and that it is due to the pressure exerted by the fluid forcing the epididymis away from the testicle, and that it is only present in cases of old hydrocele, but this is a mistake, for I have constantly

demonstrated its presence in comparatively small and recent hydroceles. In some cases this enlargement of the epididymis can be readily accounted for by the presence of some slight inflammatory or irritative condition in the urethra, and its gradual spread along the vas deferens; in others it may be the result of some trivial injury inflicted on the epididymis itself; but, in many cases no satisfactory explanation can be found. It is thus extremely difficult to account for the so-called primary, essential, idiopathic hydroceles, but the same difficulty does not occur in secondary, symptomatic hydroceles, for in them we have the presence of some definite lesion such as tubercular or syphilitic deposit, or some other equally decided morbid condition as a cause.

To return to the history of our case. Soon after admission he was tapped, and 45 ounces of dark-coloured fluid, containing an enormous percentage of cholesterine, which formed a thick and glistening layer on the top of the recipient vessel, flowed through the cannula. Iodine was injected at a subsequent period when slight re-effusion had taken place; but as this method of treatment failed to effect a radical cure, a catgut drain was inserted under spray, and although putrefaction took place and his progress towards recovery was thus delayed, the patient has now permanently got rid of his malady so far as the hydrocele is concerned.

The case of which I shall now speak is no longer in hospital, but most of you had an opportunity of examining the patient some little time ago. I refer to J. B., *æt.* 45, who was suffering from an encysted hydrocele of the

spermatic cord. In his case there was a scrotal tumour on the right side, extending from the external abdominal ring to the end of the scrotum. In appearance it bore some resemblance to a sausage, but it was irregular in outline when the skin was tightly stretched over it. It was dull on percussion, fluctuation was distinct, and it was translucent. The testicle was distinctly felt attached to its lower extremity. On careful examination its true character was unmistakable, but a careless observer might have regarded it—1, as a hernia; 2, as an encysted hydrocele of the testis; 3, as a diffuse hydrocele of the cord. I have already dwelt upon the difference between a hydrocele and a hernia, and repetition is unnecessary. The symptoms upon which I relied as distinguishing the tumour from an encysted hydrocele of the testis were its shape and the possibility of separating the testicle and epididymis from it. This was only done with difficulty, as the swelling encroached closely on the gland, still it could be made out with sufficient distinctness to prove that it was not a cyst arising from the testicle or epididymis. Before discussing the differential diagnosis of encysted and diffuse hydrocele, I shall first explain shortly the pathological bearings of the two conditions. In the former a thin-walled cyst, possessing the ordinary character of a serous membrane, is developed in the connective tissue of the spermatic cord; it generally arises from an imperfect obliteration of the prolongation of peritoneum formed at the period of transition of the testicle, and in this space effusion of light-coloured fluid takes place. In the latter—*i.e.*, diffuse hydrocele—there is simply an œdema, the cells being converted into large

vesicles. The one is therefore an encysted collection of fluid, the other an œdema. Fluctuation is common to both, but the feeling of a continuous wave of fluid which was so characteristic a feature of our patient's case would certainly not have been present had the swelling been simply œdematous. Again, a diffused hydrocele, when of large size, is somewhat pyramidal in shape when the patient is in the erect posture, and becomes elongated when the recumbent position is assumed ; but in the case now under notice no such differences were manifested. These points seemed to me to be sufficient to prove that we had an encysted hydrocele of the cord to deal with, and paracentesis showed that I was correct, for 12 ounces of clear, highly albuminous fluid flowed away, and the whole abnormal swelling at once disappeared. The fluid was examined for spermatozoa, but none were found. The means adopted for the man's permanent relief will be noticed subsequently.

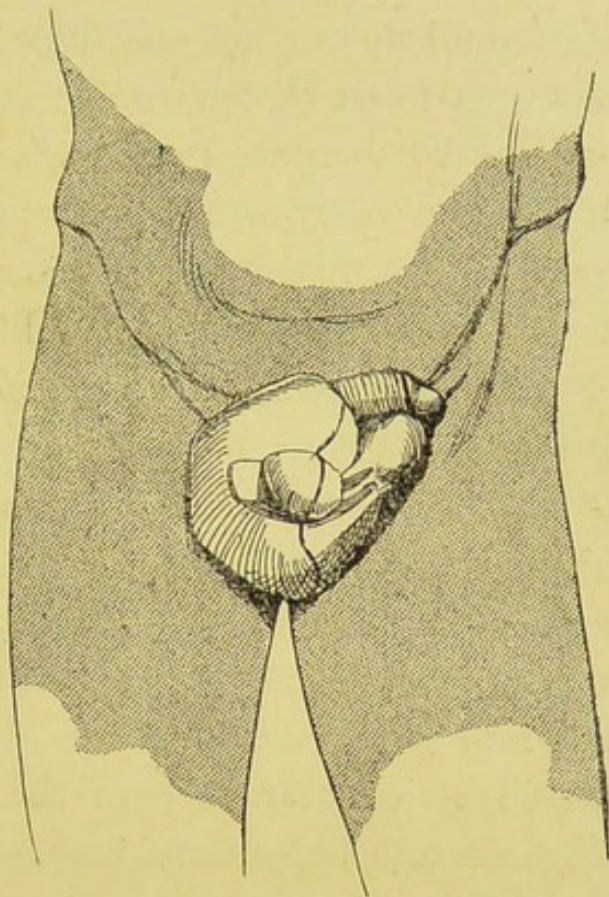
There is, however, gentlemen, yet another abnormal condition with which encysted hydrocele of the cord might be confounded, *viz.*, hydrocele of a hernial sac, of which I have recently had an example in private practice, a notice of which may interest you. My advice was sought some time ago concerning a scrotal hernia in the case of a little lad. The rupture was reduced, a truss applied, and strict injunctions were given that truss-pressure should be kept up constantly.

About fourteen months afterwards the boy was brought to me on account of the supposed re-appearance of the hernia, and on examination a small, somewhat elongated scrotal swelling was found in the situation previously

occupied by the rupture. It was tense, dull on percussion, irreducible, and translucent, and when the child cried, which he did most lustily, there was no increase in size. The testicle could be felt below and behind, and could be easily isolated. There was, then, no evidence of the previously existing hernia, whose radical cure had been achieved by well kept up pressure, and the scrotal tumour derived its origin from effusion into the hernial sac. I tapped it and gave vent to an ounce of clear albuminous fluid; it speedily refilled, but ultimately disappeared spontaneously. The history furnished the chief means in reaching a diagnosis. This case was exceptional in two respects, *viz.*, it occurred in a young patient and the fluid was clear. Most cases of hydrocele of a hernial sac have been met with in old people, and the fluid has generally been dark, but cases such as I have mentioned have been recorded, and in the present instance I have no doubt of the correctness of the diagnosis.

The next case was one of simple vaginal hydrocele, but it was one of considerable interest, as it presented some very unusual features. The patient was an old man sent here from the poorhouse, who was the subject of a hydrocele of large size on the right side. If you look at this drawing, for which I am indebted to Mr. Ramage, and which gives a very fair representation of the appearance presented by the patient's scrotum, you will see that there is a large tumour with two elevations on its surface, and that over the larger of the two the raphe passes. On the application of light, translucency was evident throughout, but this test showed that the walls of the superficial lobules were much thinner than were those of the tumour upon

which they rested. On examining the anterior aspect of the swelling, an opening in the tunica vaginalis, large enough to admit the tip of a forefinger, was found: in feeling it bore much resemblance to that presented by the external abdominal ring when it is felt through the integument. Through this opening there was a direct communication between the cavity of the tunica vaginalis and the cavities of the superficial swellings, for they could be emptied of their contents by making pressure upon them, and they could be made more prominent by squeezing some of the fluid out of the vaginal cavity into them.



Having now explained the clinical features presented by this case, let us next see how we may account for them; and here I can only offer you some hypotheses, for I am unable to speak dogmatically. The opening in the anterior wall of the tunica vaginalis may have been congenital, or it may have resulted from a wound of the tunic which remained patent after a previous tapping.

Regarding the former of the two propositions we are quite entitled to believe that such a congenital deformity

may have existed, as such "freaks of nature" are not uncommon in the human body ; and reasoning from analogy, it is not unlikely that this may furnish the correct explanation, and in that case we can readily account for both the opening and the circumscribed swellings which our case presented. It is not, however, impossible that the opening was traumatic in its origin, that it was occasioned by the wound inflicted by the trocar, and that the swellings arose from an escape of the hydrocelic fluid into the connective tissue. If so, it is strange that the fluid should not have forced its way more widely—in short, that a general œdema of the scrotum did not result, instead of the small circumscribed collections. I am, therefore, of opinion that it was congenital, and I am strengthened in this view by the fact that the opening was of much larger size than would have resulted from the wound of a trocar of even the largest dimensions, and there are other problematical indications on which I need not dwell, all of which suggested a congenital and not a traumatic origin. Béraud found in a somewhat similar case, met with in the dissecting room, that there were a number of processes of the serous tunic forming glove-like diverticula, and that the superficial cyst arose from the distension of one of these, and the case I have just brought before you was doubtless due to some such congenital peculiarity of the tunica vaginalis.

The next case to be brought before you was an example of a very rare form of hydrocele, and one which I have never before encountered. A man, *æt.* 26, was admitted to Isaac's ward complaining of great pain in his right inguinal canal, and on examination a swelling, over which

he had been wearing a truss for two years, was found. It was of considerable size and tender to touch, there was an indistinct feeling of fluctuation, and no impulse on coughing. The right side of his scrotum was undeveloped and empty, the testicle not having descended. Shortly before admission he had strained himself, and the inguinal swelling, of which he had always been conscious, became increased in size and painful. The diagnosis was easy, *viz.*, retained testicle with effusion. A few days later, the tenderness had very much abated, and the swelling was much lessened. I cut down upon the testicle, allowed the fluid to escape, and enucleated the gland which was lying in the inguinal canal. A piece of omentum which blocked the internal abdominal ring and was adherent to the testicle was ligatured and removed. The wound healed readily and the patient has had no further trouble.

The following case shows you that you should make use of the translucency test, not only for the light it throws upon your endeavours to determine the true nature of scrotal swellings, but also for the purpose of enabling you to avoid an error which has frequently occurred during paracentesis of a hydrocele, *viz.*, wound of the testicle. Many of you will recollect a man who was recently in the lock ward suffering from chancroid, and who was the subject of a scrotal tumour which was readily diagnosed as a common hydrocele. Before tapping him we examined him with a view to ascertain the position of the testicle, a fact which can be elicited by making digital pressure on the tumour at different points, and also by the opacity of that part of the hydrocele where the testis lies. You know

that in most cases it is to be found about the centre of the scrotum posteriorly, but in the case of which I now speak palpation led us to believe that it was situated, not behind, but in front, and on making the scrotal bag tense and placing a candle behind it, and then looking through the tumour, our previous opinion was verified.

The experience gained through an examination of this case should warn you never to tap a hydrocele without first making sure of the position of the testicle, else you may effect what Dupuytren has told us he saw done on several occasions, *viz.*, penetration of the testicle, a proceeding which might lead to consequences not only discomfiting to yourselves, but disastrous to your patient. The unusual situation of the testicle in our case was due to congenital malposition of that organ, but it sometimes occupies a similar position from the occurrence of previous inflammation in the tunica vaginalis and the contraction of adhesions between the gland and the tunic by which the testicle is drawn forwards.

So far, gentlemen, I have said but little regarding the treatment of hydrocele, and that part of our subject must now engage our attention ; and first, with regard to palliative treatment, paracentesis of a hydrocele is a very simple operation, and may be, as I am now about to show you, very readily performed. I have here a patient with an ordinary vaginal hydrocele about the size of a small coconut. I have ascertained that the testicle occupies its normal position, the skin has already been thoroughly purified, and the trocar is aseptic. The patient seats himself while I, kneeling in front of him, take hold of the tumour with

my left hand and make it tense, and then, avoiding any superficial vein, I boldly plunge the trocar into the hydrocele, inclining the instrument slightly upwards so as to avoid the testicle. The fluid is now allowed to run off by withdrawing the trocar from the cannula, and when the hydrocele is emptied it will be withdrawn. Simple though this operation is, it is not altogether free from accidents, as witness a case not long since in Benjamin ward where a student lodged the trocar in the patient's testicle, the result of a too violent and rather misdirected thrust. The patient fainted at the time, and had a sharp attack of orchitis subsequently. Suppuration, and even gangrene have been known to follow paracentesis, but such occurrences are infinitely rare, and the ordinary result is a gradual reaccumulation of the hydrocelic fluid, although simple tapping is occasionally, though but seldom, followed by a complete and permanent cure. And now before adducing cases where our attempts to effect a radical cure were successful, let me first bring under your notice a case where we failed to procure that most desirable result, for failures are sometimes as instructive as successes, and the example about to be related presents features of not a little interest. The patient, A. H., *æt.* 76, with whom many of you are acquainted, was in the accident ward the other day for the purpose of having his hydrocele tapped, and I then took the opportunity of laying before you the following history of his case: When he first sought my advice he was suffering from a chronic vaginal hydrocele, and as he stated that he had been tapped on five previous occasions, that the intervals between the tappings were becoming shorter and shorter, and as he

expressed anxiety to have some radical measures employed, I was desirous to comply with his wishes. On account of his age and infirmity I was unwilling to risk injection of iodine, as in the aged it is apt to be followed by untoward results. I therefore determined to insert a catgut drain, for I felt assured that, if I should succeed in carrying out antiseptic treatment properly, the absence of any undue irritation would be ensured, and that a cure might be safely achieved. The hydrocele was tapped under spray, and a probe armed with nine threads of thick catgut was passed into the cavity of the tunica vaginalis, near the lower part of the scrotum, and brought out close to the external abdominal ring. The projecting ends of the drain were then tied together, the perineum was well stuffed with loose gauze, the external dressing was kept in place by drawing the penis through an opening cut through the centre of the gauze and waterproof, and antiseptic and elastic web bandages were employed to keep all in accurate position. As there was no inflammation, no rise of temperature, and no pain, excepting on one occasion from over-tightness of the bandages, and only some serous discharge from the points of emergence of the drain, the daily progress is unworthy of notice. Ten days after the insertion of the drain its external ends dropped off, and three days later the little granulating points which were left after the separation of the catgut were found to be whole, and the patient was dismissed from hospital. I saw him again in a fortnight, and there was no reaccumulation of fluid; but a month later a certain degree of fulness was perceptible, and when he next came under my observation

four months after the operation, the vaginal sac was even more distended than it was when he first sought my assistance. Examination showed that the hydrocele was perfectly translucent at *all* points; there was no evidence of the presence of the drain, and when he was tapped a quantity of clear, light amber-coloured fluid was drawn off.

A careful and prolonged examination of the scrotum after tapping failed to elicit any sign of thickening of the scrotal walls, the parts presenting the usual flaccid feeling observed in cases of the kind. The catgut had, then, gentlemen, been completely absorbed,—a fact which we must regard with both interest and wonder,—and I ascribe the failure of the means adopted to the smallness of the openings made, and to the entire absence of the inflammatory process. A like mode of treatment was adopted in the case of hydrocele of the cord, and proved curative. In it we succeeded in keeping the parts aseptic; there was some inflammatory swelling, but the pain was of the most trifling character, and the result was eminently satisfactory.

The use of drainage by catgut (or by india-rubber tubes, as has been advocated by Volkmann of Halle and Trendelenburg of Rostock), in the treatment of hydrocele, although occasionally useful, is not a method which I would advise you to adopt, for less troublesome and, to say the least, equally efficacious measures are at your command. Very many different modes of obtaining a radical cure have been proposed, such as injections of iodine, spirit of wine, port wine, solutions of alum, carbolic acid, sulphate of zinc, or corrosive sublimate, chlorine gas,

and lime-water, etc. ; incision of the sac, or excision of a part of it ; silk and metallic setons ; tapping and applying pressure by strips of adhesive plaster ; scratching the interior of the sac with a sharp needle, or passing a probe coated with nitrate of silver into the cavity after paracentesis, and other plans which do not require notice.

Of all the procedures yet proposed, the injection of iodine holds the first place in the estimation of the profession, and deservedly so, for it is only in exceptional cases that it fails.

In proof of its almost universal acceptance, I may tell you that Mr. Syme related, in one of his charming essays, that the treatment of hydrocele was wont to be a favourite subject with students for their graduation theses, but that "since the use of iodine has been introduced the theses on hydrocele have gradually become fewer, until they entirely disappeared ; whence I concluded that the advantages of this means were so manifest that they had led to the abandonment of all the others, and left no room for discussion," and although many attempts have been made to supplant injection by other modes, they have been but ephemeral.

An opportunity was recently afforded you of seeing how this little operation should be performed ; and although many different plans are in use, such as those of Sir Ranald Martin, Curling, and Van Buren, the mode proposed by Mr. Syme, which I invariably employ, is the simplest and surest one. His directions were as follows : "In the first place, the patient should stand while the sac is tapped, in order to let the water be drained off completely. Then

two drachms of the Edinburgh tincture of iodine, which is much stronger than that of the Pharmacopœia, should be injected, unless the tumour is either very large or very small, when there may be a corresponding increase or diminution of the quantity employed ; and, lastly, a rough shake of the scrotum should diffuse the injected fluid over the whole surface of the cavity." To these instructions I would add a single suggestion for your guidance, *viz.*, that after the trocar is withdrawn the cannula should be well pushed home, so that there may be no risk of its falling out or receding so far from the vaginal cavity as to permit of the entrance of iodine into the surrounding cellular tissue.

Injection of iodine occasions considerable pain at the time,—indeed, so acute was it in one of my cases that the patient fainted,—but it speedily disappears. If the patient is very timid and sensitive a preliminary injection of a solution of cocaine may be practised, three to five grains dissolved in a drachm of water, being injected after the escape of the hydrocelic fluid, and five minutes before the iodine is used. About twenty-four hours afterwards you may look for the recurrence of pain, and you will find some effusion and swelling of the testicle, which generally subside in the course of a few days. The orchitis does, however, vary greatly in degree in different cases ; for I have myself seen one where it was scarce perceptible, yet in it the cure was perfect, but I have also had patients under my care where there was great orchitis and extreme pain. In the case of the man with hernia and opaque hydrocele there was positively no tenderness nor enlargement of the testicle or its appendages after injection ; in short, the case simply

pursued such a course as follows simple paracentesis, *viz.*, slow re-effusion of fluid.

When considerable inflammatory reaction ensues I have found much relief to accrue from the application of a tobacco poultice made by boiling an ounce of cut tobacco with a sufficiency of water to make a cataplasm, and then adding linseed until a proper consistency is reached. No other treatment is required, but before the patient resumes his ordinary avocations he should provide himself with a suspensory bandage, which he should continue to wear for some weeks.

The pathological changes produced by the injection of iodine, by which the upset balance between secretion and absorption is restored, are not always alike, for *post-mortem* examination has shown that in some there was complete obliteration of the vaginal cavity, in others partial adhesions, and in a third class no adhesions were discoverable. Billroth has suggested that the arrest of the hypersecretion is due to shrinkage of the serous membrane with new formation of endothelium, that there is condensation and probably increased formation of the connective tissue, which, contracting on the serous membrane, causes it to shrink to its normal size, and in this wise we are enabled to account for a radical cure without the presence of that condition of parts which was for long deemed essential, *viz.*, complete agglutination of the two surfaces of the tunica vaginalis.

Here, gentlemen, I would like to give a word of caution regarding the treatment of sympathetic hydroceles, and this I would not have thought it necessary to do had I not

quite recently met with a case of syphilitic sarcocele where there had been considerable effusion, as is often the case, and where a medical man of much experience had, without ascertaining the cause of the hydrocele, injected iodine with most unpleasant and undesirable results to the patient. Need I say that the disease was perfectly curable by other means, but not by those adopted, or that, when a decided and evident cause such as tubercle or syphilis exists, the disease, and not the symptom, should be treated ?

In a recent case you saw me apply iodine to the interior of the hydrocelic sac in another way. Instead of drawing off the fluid by a trocar, I passed a sharp-pointed probe threaded with silk through the lower part of the swelling, and brought it out above, and allowed the serous fluid to drain away by the side of the ligature. After all the water had escaped, I moistened about an inch of the thread with iodine liniment, and by making traction on its other end the iodised portion was brought within the cavity of the sac. A little gentle friction was next used for the purpose of spreading the iodine over the secreting surfaces of the hydrocele, which, by the way, was a small one. The same process was repeated by the patient at intervals of an hour, and when, after the eighth application of iodine, sharp pain was felt, the thread was altogether withdrawn. Slight swelling and effusion followed, but a radical cure resulted. Mr. Furneaux Jordon, when submitting this mode to the profession, wrote strongly in its favour, and he considered it specially applicable to encysted hydroceles of the cord and testis, as "the walls of the cysts are usually thin, and collapse so much when their contents are withdrawn that

the injection of iodine is uncertain. The end of the cannula may be outside the cyst, and the iodine solution be consequently injected into the connective tissue at its exterior." With the seton this cannot happen, and in such cases as those you will find it a reliable and efficient measure.

If you meet with a case where iodine fails to effect a radical cure, I think that your best course would be to practise antiseptic incision with partial excision of the sac, for this method is a most thorough and reliable one, and far superior to any other yet suggested. If you adopt it let me impress upon you the absolute necessity for the adoption of the most rigid antiseptic measures both during the operation and subsequently.

Neumann has recently adopted a mode of radical cure of which he speaks very favourably, and if further experience should prove its reliability, it is likely to become popular. It consists in antiseptic paracentesis, the cannula, after being pushed well home, being allowed to remain in that position for two days, during which the scrotum is enveloped in a cotton wool dressing. After the removal of the cannula a cooling lotion is applied. Neumann states that as a result of this mode complete adhesion of the walls of the sac is accomplished in from seven to nine days, without the occurrence of inflammation or suppuration, the occlusion being due to the formation of a fibrinogenous ferment following a slight exudation of leucocytes. The method is simple and rapid, and apparently quite free from risk.

In addition to the cases now reviewed at length, examples of other forms of hydrocele have been recently under treat-

ment in my wards, such as double vaginal hydrocele ; acute vaginal hydrocele accompanying epididymitis ; chronic effusion into the cavity of the tunica vaginalis in a case of gummatous deposition in the testicle ; encysted hydrocele springing from the epididymis ; congenital hydrocele ; and an example of a very rare form, where there was effusion between the tunica vaginalis and tunica albuginea. Opportunities have thus been afforded of examining most of the known varieties of hydrocele, a circumstance which proves that within a limited area this disease may be encountered in varying and many-sided forms, and that a correct knowledge of this subject is therefore indispensable to all who propose entering on surgical practice, and who desire to conduct it successfully.

LECTURE VI.

THE TREATMENT OF SYPHILIS.

GENTLEMEN, a witty Frenchman gave this advice to his students: "When in doubt, treat for syphilis," and the development of that disorder during recent years from the standpoint of the physician and pathologist gives ample reason for regarding the advice thus tendered as sound. Only it was probably sounder then than now, for many cases that are readily recognised at the present time as of specific origin would have been included some years ago in the long catalogue of undefined disorders which is more or less the unhappy possession of every medical practitioner. The recognition of the important place occupied by syphilis as the cause of almost countless morbid conditions, makes an acquaintance with its treatment a matter of absolute necessity, and to this subject I intend to direct your attention to-day. It is universally allowed that no medical man, whatever his line of practice, can afford to disregard syphilis, for it is encountered alike by the physician, the surgeon, and the gynecologist; the oculist meets with it in some of its worst forms only too often; the psychologist frequently finds that it presents some of the most interesting and attractive problems for his solution; the dermatologist has no wider field for his observation than that occupied by the different stages of this protean malady; the laryn-

gologist is daily called upon to baffle its onslaughts, while the aurist attempts to stay—sometimes with but little effect—its baneful influence on the special sense to which he devotes his best efforts. The subject is so wide that it would be vain to attempt to do more than to rapidly outline the treatment suitable for acquired syphilis through its three great stages, leaving the modes appropriate for dealing with its different local manifestations, and for congenital syphilis, for subsequent consideration.

Let me, therefore, without further preamble invite your attention to the treatment of the first evidence of the disease, *viz.*, the hard chancre.

At the very outset of our inquiries as to the most efficient mode of controlling acquired or accidental syphilis we are met with one of the numerous difficulties encountered during our pursuit of the desired knowledge in the shape of doubt as to our mode of dealing with the primary sore. Can we abort the disease by excising the sore, or is such a measure useless? Much has been said on both sides of the question, and more has yet to be said before it can be finally settled.

The opinions regarding excision or non-excision must in great measure depend upon the views which are taken as to whether the action of the virus is for a time confined to the point of its entrance into the body as shown by the site of the chancre, or whether the sore is the first local evidence of general constitutional infection. If the former view is held, excision is urgently called for; if the latter is favoured, then removal of the sore is utterly futile.

In forming a conclusion as to whether the virus enters

the circulation immediately or not, we will, undoubtedly, be in a great measure guided by the views we hold regarding the nature of the virus itself. Is it a subtle, immaterial poison which is, as Fournier puts it, as quickly diffused through the body as a vapour in an atmosphere, and of which, as a toxic agent, one atom is as sure as a ton? If this be its nature, of what avail would be excision of the primary effect? The indisputable answer may be given in a single word—none. But again he asks, is not the syphilitic poison microbic? Is not the chancre the first lodging house of the microbe from which emigrates the specific family to lead to the formation of new colonies throughout the whole body? If the sore is the nest whence the general infection will radiate, and if its occupants are living things growing and multiplying, and requiring an appreciable time for that process, then, if ablation of the sore be practised sufficiently early, it would seem as if one should be able to completely annihilate the disease. At the present moment the microbic character of the virus is held almost universally, and theoretically every one should uphold excision; but there is, as I shall show you presently, much dubiety among the most experienced and learned syphilographers as to the practical benefit to be derived from operative measures. The prolonged period of incubation without the appearance of any visible sign to guide one to the point where the virus has entered the body very materially increases the difficulty of using effectual abortive measures, and the impossibility of transmitting syphilis from man to the lower animals makes experimental research useless, and we are thus deprived of what would have been simply

invaluable evidence. For it would have been easy to determine by a series of properly regulated experiments at what period, if at any, destruction or removal of the inoculated part would prevent general systemic infection ; but as this cannot be attained it has been urged, with a considerable show of reason, that we should rely upon analogy as demonstrated by the effects of other morbid poisons of whose influence lower animals are susceptible, and if the toxic agents thus employed are derived from disorders with well-marked incubatory periods, although there may be room for a certain amount of fallacy, the inferences to be drawn ought to be fair enough.

I do not consider it necessary to enter upon this question at any length, but one or two references may not prove uninteresting.

Renault, surgeon of the Veterinary School at Alfort, inoculated horses with acute glanders, he excised the part and applied the actual cautery one hour afterwards, yet the animals died of the disease. Similar experiments were carried out with sheep pox with a like result. In a case of hydrophobia, which I had recently the opportunity of watching with my friend Dr. Brachet of Aix-les-Bains, Paquelin's cautery was most thoroughly and searchingly applied within twenty minutes of the infliction of the bite, the man was placed under Pasteur next day, but he died in my presence from hydrophobia four weeks afterwards. Bousquet, immediately after practising vaccination, applied wet cups, followed by the use of a powerful disinfectant, yet the appearance of the vesicles was in no way interfered with. These cases are a fair sample of the non-

effect of abortive treatment when employed in connection with other animal poisons, and must for the present suffice.

A case of Berkeley Hill's is often cited for the purpose of proving that the absorption of the syphilitic virus may be extremely rapid. It was this: A man tore his frænum during intercourse, free bleeding followed, twelve hours later fuming nitric acid was freely applied, a slough separated, but one month afterwards induration appeared followed by general syphilis. Bumstead mentions a case where abortive treatment was applied six hours after intercourse, yet secondary symptoms followed. Diday cauterised sores four and a half and five days after coitus but failed to prevent secondary manifestations. Rasori removed a chancre twelve hours after it first appeared, forty-eight days afterwards roseola, and mucous patches in the throat appeared. Mauriac excised a chancre the size of the head of a pin, removing the surrounding skin freely, fifty to fifty-six hours after it appeared, but secondary symptoms manifested themselves in due course. In another case he excised two pin-head chancres, four hours old; seventy-one days afterwards constitutional symptoms appeared. In neither of Mauriac's cases was there any glandular enlargement. Neumann excised a chancre and six enlarged glands, in fifty-three days general syphilis followed, and ultimately gummy orchitis, ulceration of the pharynx, gumma of the palate and periostitis of the tibia ensued. Fournier cites this case as a refutation of the theory that if excision fails to prevent general syphilis it at any rate modifies and mitigates it; of this theory he says, and certainly justly, it is "*une pure chimère*". The cases just mentioned are very powerful evidence against the

success of the abortive treatment, but we have yet to hear the other side before coming to any conclusion, if in the present state of our knowledge any conclusion can be come to. John Hunter taught that destruction of the sore was the proper course. Ricord followed on the same track, but he subsequently abandoned that position, as did also Sigmund of Vienna. Gebert, in a recent review of the treatment of syphilis used in Blaschka's Policlinic in Berlin, states that in suitable cases, and to this I shall refer subsequently, abortive treatment is employed, but that even when the operation is carried out under the most appropriate conditions, success was only obtained in a small number of cases. Ehlers, of Copenhagen, has published an account of 584 cases where they were employed, and he states that success was obtained in 137. Crivelli's statistics show 102 successes in 454 cases. If these were all cases of primary syphilitic sores the results would be encouraging almost beyond expression, but Fournier has called attention to certain fallacies connected with them which make them almost worthless. He asks what confidence can be placed in the reports of syphilologists who profess unicism, as for them "*un chancre est un chancre*," whatever its history and appearance, whether it appeared immediately after exposure to contagion or had a prolonged period of incubation, whether it was soft or hard. Further, he points out that the patients were not kept sufficiently long under observation to prove absolutely their complete immunity from further symptoms, and that confrontation was not adopted so that the source and nature of the contagion were not ascertained. Ehlers himself does not seem to

have much confidence in abortive treatment, for he advises the use of mercury even in successful cases.

Baumler advocates excision when the sore is so placed that it can easily be done, but even then he says that this proceeding must not be allowed to excite too much hope. Sir G. M. Humphrey, of Cambridge, has advised excision, and Jonathan Hutchinson holds that "if a patient who has never had syphilis before, and who can give his dates correctly, comes under observation, at any period within a fortnight of the contagion, with a single sore, it will certainly be wise to destroy it utterly". He uses fuming nitric acid, or free excision with the actual cautery. He allows that success is not certain, yet according to the generally received views it should be, if measures are taken *within a fortnight of contagion*, for but few hard sores appear at so early a period, and if it is merely chancroids that are being dealt with, syphilis would not follow even were they left untouched. But you may rest assured that so keen, so accurate, and so logical a man as he is does not leave his position so unguarded as this would imply, for he believes that "in a majority of cases, not only is the particulate virus of syphilis implanted but with it the contagious products of peculiar forms of inflammatory action," and that "if the patient has never had syphilis before, whatever are the characters of the primary sores which he may exhibit, the chances are two to one that the sequel will prove that it contained the germs of true syphilis". In other words, as I read his opinions, that the "mixed chancre" of Clerc is of much more common occurrence than is generally supposed, that the chancroid is a sort of

danger signal indicating the chancre that is to follow, that a soft sore should be destroyed, not so much for the purpose of arresting its contagious properties and preventing it from infecting the surrounding parts, as to root out the syphilitic virus which is fructifying within a limited and defined area, having not yet spread beyond the limits of the point where it was implanted. Following Bassereau's teaching as I do, I cannot accept Mr. Hutchinson's, nor would my own experience, which, although not inconsiderable, is limited when compared with his, lead me to do so. The soundness of the advice to destroy all sores appearing soon after suspicious intercourse I am quite prepared to allow, but I cannot believe that the odds in favour of their containing the germs of syphilis are as great as stated by Mr. Hutchinson. The same authority states that the excision of a sore when indurated can seldom do any harm, but will be rarely productive of good. In this, most recent syphilologists agree. R. W. Taylor, the well-known American syphilographer, holds that "within the first few days the chancre is deeply rooted and infiltration extends widely into neighbouring tissues. From the very first the infective process is one of growth and diffusion. The blood vessels are filled with round cells which also distend the perivascular lymphspaces and thromboses are formed. The infection of lymph channels is much quicker than clinical observation would lead one to believe, so that even on the first appearance of the chancre changes will be found in the vessels far away and excision of the local lesion does not prevent the further sequelæ from developing."

Horowitz says that the virus is absorbed into the system

with unusual rapidity, and that after the lymph glands, the virus directly enters the blood stream, and Fiuger of Vienna believes that even during the primary stage the virus has already reached the general circulation, and his suggestion that syphilis is due not only to a parasite but also to the virus which is produced by it which affects the blood and lymph systems, as well as by diffusion from the initial effect, is extremely interesting. Spillmann, Kaposi, Neumann, S. Pollitzer, Zeissel, Mauriac, Renault, Van Buren, Ernest Lane, Bumstead and others regard excision as futile, and when we remember how speedily and certainly the chain of lymphatic glands in direct anatomical connection with the sore becomes affected, removal of the sore would be closely analogous to cutting out a cancerous mamma and leaving an adjoining axillary tumour untouched. Even were it possible to remove the glands, it is not improbable that the evolution of the disease would proceed if the observations I have just quoted regarding the rapidity of the absorption of the syphilitic virus are to be accepted, especially if Fiuger is correct in his contention, which is, of course, as yet, merely hypothetical.

I have not yet given you Fournier's opinion on the point in question because I have purposely retained it to the last, as the views he so tersely and definitely expresses are those to which I myself adhere. He sums up the position thus—I give you a literal translation of his words—"From what has preceded you will certainly be able to guess that I am not a partisan of excision. I shall avow it myself: I do not believe in it, and I have no confidence in it, from what I have seen, and from the results I have obtained up

to to-day. However, I do not hesitate to say that, in the conditions I have just laid down, and, in the actual state of science on this subject, our duty is to practise excision." He says also that one should not put it in the power of a patient to say, "*C'est à mon médecin que je dois ma vérole*," meaning of course, that a patient might think that had excision been practised constitutional symptoms might have been averted. His colleagues in the Paris Hospitals give their adhesion to Fournier's views. "You will not find," says he, "a single one of my colleagues disposed to plead the cause of excision from his experience.' The conditions to which he alludes as justifying excision are very rigidly laid down. 1. The chancre must be very recent, a very few days old at most. 2. It must be destitute of induration. 3. There must be no glandular enlargement. These conditions, coupled with the proviso that the chancre must be solitary and not larger than a lentil, are the circumstances which Blaschka also regards as essential to success. Need I say that we are not often so happily placed as to be able to take advantage of them, for how seldom do we see, especially in hospital practice, cases thus early?

If excision is practised it should be done in a most thorough manner, every particle of affected tissue being as carefully extirpated as if a cancer were being dealt with. A considerable portion of the surrounding skin must therefore be removed, and the most rigid antiseptic precautions should be adopted to prevent chancrous contamination of the wound. Sutures may be employed to keep the cut edges together. Reappearance of the sore is not uncommon, but no second operation should ever be carried out.

If neither destruction nor excision is practised, the treatment of the sore is usually a very simple matter, the dressing varying with the character of the chancre. For a desquamating papule, dry boracic lint will suffice ; for a sore with ulceration black wash is probably as suitable as anything. If there is inflammation to any extent iodoform is much favoured by many, and as it has now a perfectly respectable reputation, being used for so many purposes altogether apart from venereal diseases, there is but little reason for its non-employment. Some years ago this was not so, for then it was quite possible to diagnose the nature of his complaint by the tell-tale odour emanating from the individual, as I myself once did, much to the amusement of a companion, in the Nevski Prospekt of St. Petersburg, and it is now unnecessary to adopt the ruse suggested by a cute American, *viz.*, to wrap up a finger in an iodoform dressing in order to divert attention from one part of his body to another so that no suspicion of the real nature of the disease might be awakened. Güntz has recently recommended aristol as an odourless substitute for iodoform, and good results have been obtained in his hands.

The healing of the sore and the absorption of the induration will be much accelerated by the internal use of mercury, but of this I shall speak in connection with secondary syphilis. The bubo of syphilis does not require any treatment unless it inflames, when it must be treated on ordinary principles.

Having now discussed the local treatment of the sore, we must next enter upon the general treatment of constitutional syphilis. But before doing so, let me say

something regarding a much-canvassed question, *viz.*, Is syphilis curable? or is it as Sir William Gull put it, "syphilis once, syphilis always, syphilis all the days of a man's life"? Much depends on what is meant by cure, for if it signifies that an *absolute immunity* from syphilitic symptoms after a certain time is to be guaranteed, then I must agree with Sir William Gull, but if it means that in all probability the patient will pass through life without the manifestation of any signs to remind him of his almost forgotten disorder, then I think that one is justified in regarding syphilis as curable. We have of course an undoubted and absolute proof of the cure of syphilis in the case of those who are unfortunate enough to contract the disease for the second time. Such cases are certainly rare: I have myself seen only two examples. Still the fact that they do occur is sufficient to verify my contention, and if those who have once suffered from syphilis were not more careful in exposing themselves to the risk of a fresh contagion than are those who have never been affected by it, the record of cases would undoubtedly be a much more ample one. I have been very favourably situated for forming a correct judgment as to the effects of treatment, for I have had opportunities of watching a large number of cases from the initial manifestation of the disorder, through the secondary period and onwards, seeing the individuals from time to time for five, ten, fifteen, and twenty years, having their wives and children under my care as the ordinary medical attendant of the household, and I have found that where treatment has been faithfully carried out for a sufficient length of time, what may be called a cure has been achieved,

the original bearer of the syphilis has remained absolutely free from symptoms, and he has not conveyed it to wife or child. But, when mercury has not been taken, or when the course of treatment has not been regularly followed, the state of matters has been very different, for infection of others has been common and the appearance of tertiary symptoms in some of their most revolting and deadly forms has not been at all a rare occurrence.

Holding these views, you can readily understand that I regard the regular and methodic treatment of syphilis as a matter of the utmost moment, and that every case should be subjected to it, for, although some cases seem to recover spontaneously, no one can foretell what case will do well or the reverse. A copious induration of the primary sore is said to portend a severe attack of general syphilis, but the converse does not hold good. Every case, then, must be treated ; let us now consider how.

The treatment is hygienic, tonic and specific. We must not rely on one of these modes, but on a combination of the three. Specific treatment without attention to hygiene would not improbably end in failure. When you see a patient suffering from syphilis improve rapidly after his admission to hospital, the improvement is not altogether due to the medicines given, but to his new and improved surroundings, and to his being obliged to adopt a wiser and more healthy regimen, and to the abandonment of the excesses previously indulged in. The hygienic treatment consists in obedience to all the laws of health so as to attain the greatest possible degree of bodily vigour. Moderation and temperance in all things are essential,

excesses of every kind must be eschewed, and this applies not only to diet but to exercise, for violent exertion and undue fatigue must be avoided. The food should be plain but nourishing; stimulants, if indulged in at all, should be taken in the strictest moderation, and fruits, especially acid ones, must be avoided during a mercurial course.

The body should be warmly clothed, flannel should be worn next the skin, and while taking mercury the patient should be very careful to avoid catching cold. A tepid bath should be taken daily, but the frequent indulgence in Turkish baths, which patients themselves regard as a sure method of ridding themselves of the disease, is not advisable. Moderate smoking is not more harmful to syphilitics than to other persons, unless the mouth or throat is affected, when it must be entirely abstained from.

In some cases it is necessary to prescribe a course of tonic treatment before commencing specifics, for in many cases the patient is much run down before he seeks advice, and well-marked anæmia is not uncommon. Some syphilographers hold that mercury is the best tonic in all cases of early syphilis, but in some cases I am satisfied that a short preliminary course of one or other of the tonic combinations which you will find in the synopsis which you have in your hands* will prove serviceable, and will not, as has been suggested, unduly interfere with the action of the mercury which is to follow.

You must also bear in mind that "syphilis is," to use a phrase of Sir James Paget's, "the most miscible of all constitutional disorders," and that it may be necessary to treat

* See Appendix.

not only the one disorder, but at the same time to correct or modify some taint, inherited or otherwise, by which the patient may be affected.

The specific treatment of syphilis must next engage our attention, and this is a wide subject, but so much depends upon your taking a firm and thorough grasp of it, that at the risk of seeming to be somewhat prolix, I must enter pretty fully upon it. For early syphilis there is, in my opinion, one drug, and one drug only, that can be implicitly relied on, and that is mercury. The iodides which are so useful at a later period, are inert during the secondary stage, and although numberless other drugs have been vaunted as cures for syphilis—and to this list may now be added thyroid extract, the latest therapeutical novelty—there is to my mind not one of them deserving of the slightest consideration, and if we except the iodides, we may still say as Mr. Pearson said a hundred years ago: “Perhaps it would not be too much to assert that no other medicine has maintained a general good reputation as a specific against the venereal disease beyond the life-time of its first proposer”. Mercury has certainly had a chequered career since Wiedmann first suggested it in 1497 to the present day, for it has received praise and adoration on the one hand, and has been condemned as a deadly poison on the other, and as the cause of all the destructive lesions met with during the tertiary period. For example, Desprès suggested that it should be consigned to a museum of therapeutic relics, while Hermann called for an Act of Parliament to forbid its use; Mr. Rose, once a surgeon to St. George’s Hospital, most strongly denounced it, yet

Mr. Cutler subsequently found him using it in his wards, allowing its superiority to the methods he had before so strongly belauded. The unanimous conclusion of the Royal Commission appointed to inquire into the treatment of syphilis was in favour of mercury as the most efficient remedy for constitutional syphilis, and this conclusion is now almost universally confirmed. Its efficiency is admitted by both regular and irregular practitioners, for Bumstead said that "he knew it to be the active ingredient of the 'life balsams' and 'essences of sarsaparilla,' the marvellous virtues of which are proclaimed in the daily and weekly journals, religious as well as secular". Need I say more than that, for my own part, I give my adhesion to the recent utterance of Dr. Byrom Bramwell that "I would consider myself criminal were I not to give mercury in constitutional syphilis"?

The next question is: "When should mercury be first given? Should it be whenever the diagnosis of a hard sore is complete, or should we wait for the appearance of secondary symptoms?" For many years it has been my invariable custom to prescribe it during the primary stage, and by so doing I am convinced that, through the prophylactic power of the drug, the secondary symptoms have been much lessened both in degree and duration, and in some few cases where the pathognomonic symptoms of the sores were so marked that there could be no dubiety regarding their being syphilitic, no secondary symptoms showed themselves at all. This seems to be a common experience with Mr. Jonathan Hutchinson, for he says: "If this period," the primary, "has been well employed, if, in

other words, mercury has been freely and adequately given, I believe it is quite the exception for any secondary symptoms to occur at all. At any rate, if they do, they are but slightly and very feebly marked. The earlier mercury is resorted to the greater the probability that they will be wholly prevented." This early use of mercury has been objected to on the grounds that the diagnosis is not complete until the evolution of the secondary symptoms, and it has also been said that it only delays the secondary symptoms, which are of a more severe type when they do appear than would have been the case had they not been temporarily repressed. For my own part I dissent from both of these statements, for I do not consider that the diagnosis of primary syphilis is so difficult as is generally supposed, and my own experience is, like that of Mr. Hutchinson, totally opposed to the conclusions of those who espouse the second objection.

Having decided that mercury should be commenced at once, before entering upon the consideration of the exact preparation to be prescribed, or the mode in which it is to be employed, I wish to direct your attention to certain general considerations which are more or less applicable to all. First: the treatment must be carried out regularly and systematically; the patient should be impressed with the importance of the utmost regularity in following all the rules laid down for his guidance, and he must be shown that the mere removal of the symptoms from which he may be then suffering is not sufficient, but that he must remain under observation for a long period in order that relapses may be guarded against. Second: to what extent is mercury to

be pushed? At one time the answer to this question would have been easy enough, *viz.*, till the patient is thoroughly salivated, but now this is what we are most anxious to avoid, and when the slightest grade of mercurial stomatitis arises it is necessary to exhibit the greatest caution in the further use of the drug. In many cases the symptoms yield before the gums are touched—to use an expressive American phrase—but if they do not, and salivation is imminent, then another preparation of mercury, or another mode of using it, should be tried. And here I would like to remind you that every person cannot take mercury, that in some it acts, even in the most minute doses, as a powerful depressant. I have myself met with several such cases, where the patient, without having the slightest knowledge of what had been prescribed, had been able to tell a few hours afterwards from the effects produced that he had taken blue pill, and that too when the dose had only been one of two grains. Lewin has recently shown that mercury may in certain individuals cause exaltation and excitement with restlessness and sleeplessness, and in others pallor of the face, difficulty of breathing and cardiac irregularity, and it is not long since a case of fatal stomatitis following a single dose of four grains of blue pill was recorded. It is well to bear this fact in mind when ordering mercury. Much may be done to prevent salivation; for example, the patient should have his teeth examined by a dentist before commencing a mercurial course, the decayed teeth should be filled, and stumps extracted. The teeth should be brushed after each meal, and some astringent mouth-wash should be used.

The first symptom of salivation is tenderness of the gums, first seen behind the upper central incisors, or near the last molars of the lower jaw. The patient next begins to feel the teeth too long, tapping them is painful, chewing is difficult, there is a constant flow of saliva, the gums become spongy and bleed readily. The tongue swells, is coated, and is soft and flabby and bears the impress of the teeth on its sides. Pus begins to ooze from the gums, the breath is foetid and sickening, and articulation is impeded. Accompanying these local symptoms there are sometimes general feverish symptoms, with a quick pulse and a rise of temperature, diarrhoea and vomiting. When stomatitis does occur, chlorate of potash, in a mixture and as a mouth-wash, should be employed, or what is really better, compressed tablets of it may be allowed to slowly dissolve in the mouth. Certain forms of *Dermatitis Medicamentosa* are occasionally, though rarely, met with during a mercurial course, and it is well to bear this in mind lest such an eruption should be mistaken for a syphilide.

The third consideration is: How long is mercury to be continued? Here again there is great diversity of opinion. Much depends upon whether mercury is regarded as merely capable of relieving symptoms, or whether it is looked upon as a prophylactic as well. As I shall presently show you, some syphilologists are so much impressed with its prophylactic powers that they advise a prolonged and continuous course, while others, with no less faith in its good effects, consider that there is some danger of the system getting so accustomed to it that it will lose much of its power if its administration is continuous, and they there-

fore advise intermittent courses. Others, again, believe that mercury is impotent except so far as the removal of the immediate symptoms is concerned. My own practice has been to warn the patient that he must keep himself under medical supervision for at least two and a half years dating from the commencement of the disease, and for the first six months I have, wherever possible, given mercury continuously, and thereafter I have prescribed it intermittently, but never entirely giving up its use until the period referred to was reached, and from that mode I have had the happiest results. Of course I have frequently had to modify the plan mentioned in accordance with the exigencies of the cases, but in the main I think that you will find this method a sound and reliable one.

Fournier teaches that treatment must be continued during many consecutive years, at least three or four, however mild the disease may have been originally. He says: "Three to four years methodically consecrated to an energetic medication, such is the necessary minimum, I will not say to cure the disease but to suppress its dangerous manifestations for the present and the future," and again: "It is false to say that we have done with syphilis after a treatment of some months, of a year, or of two years even, the limit which it seldom exceeds. Such treatment gives only a temporary immunity, a transient quieting of the diathesis." His mode—the successive or chronic intermittent by which he considers that the primary intensity of the drug may be best maintained—is to give mercury for two months, then to pause for from four to six weeks, after which, treatment is resumed and continued for about

six weeks and followed by a remission lasting from two to three months. In the course of the first year four courses of mercury are given, in the second year three, and in the third year two. He prescribes the protiodide. After that time he puts the patient on intermittent courses of iodide for two years more. This is Fournier's general plan, but he adopts exceptional treatment in exceptional cases, such as iodide in severe cephalalgia, neuralgia, periostitis, etc., even when they appear early; mixed treatment in iritis and sarcocele, etc., and in diseases of other important organs: and not infrequently inunction where mercury internally disagrees with the patient.

Baumler says that if syphilis is destroyed in its primary lesion three or four months of mercurial treatment may suffice, if not, then six or eight months will be required. No definite assertion can be made either as to dose or to the length of time to be occupied by treatment, but it must be continued not only until the disappearance of the syphilitic manifestation but for some time afterwards, and the patient must keep himself for several months further under constant medical supervision. Ernest Fiuger of Vienna, a recent and most reliable authority, counsels intermittent treatment for two years at the very least, and then another year of medical supervision.

Jonathan Hutchinson gives one grain of grey powder from three to six times a day "seldom for shorter periods than six months". He says that, if given to a patient with a sore before the secondary symptoms appear, usually none will occur, but if an eruption does appear, as a rule, it fades quickly, and that the patient will remain free from symptoms

so long as the remedy is continued. He allows that mucous patches in the mouth and throat may show themselves, but he does not consider that their presence calls for the internal use of mercury. "In a large majority of cases," I use his *ipsissima verba*, "a six months' course of small doses appears to be adequate to the complete and permanent cure of the disease. No relapses occur and the patient remains afterwards in excellent health." "It is a question which must be left open for future accumulation of evidence whether antidotal repression of the secondary stage is influential in preventing, after a long period, the development of tertiary symptoms. It does not do so always, but it exercises a very powerful influence in that direction." Ricord held as pronounced views as Mr. Hutchinson regarding the early use of mercury, for he said that after forty years' experience he could give an assurance that, if mercury were given sufficiently early after the appearance of the sore, secondary symptoms would not appear.

I have now given you the opinions and modes of treatment of representatives of the French, German and British Schools. The American syphilographers mostly favour a long and continuous use of mercury, the course lasting for two or three years. E. L. Keyes, one of the most distinguished of their number, advocates a very precise mode which he has described in his book called *The Tonic Treatment of Syphilis*, which I may now briefly summarise. He has proved by the careful use of the *hématimètre* that mercury definitely increases the number of red cells in the blood, and that even if continued for a long period the

high standard which is attained under its use is maintained. He prescribes granules of protiodide of mercury, prepared by Lamoreux and Garnier, each containing one centigramme. He begins with one granule thrice daily after food, on the fourth day an additional granule should be taken, and so on every fourth day until positive evidence of intestinal irritation—colicky pains with diarrhœa or gums slightly touched—is obtained. This he terms the “full dose”. If time presses, or if the patient is covered with a general spreading eruption at the time when the treatment is commenced, it may be necessary to have a mercurial vapour bath every second day, or inunction daily; the latter should be stopped when the “full dose” is reached. With the aid of opium the full dose should be continued until the symptoms yield. When they have disappeared, the full dose is to be reduced to one-half, which, as it acts as a tonic, is called the “tonic dose,” and this is to be continued unceasingly day after day and month after month, unless fresh symptoms appear, when the half held in reserve, the “reserve dose,” is to be added on and continued until the symptoms abate, when the tonic dose is to be again resumed. He insists on a course of at least two years and a half, but often it is wiser to continue it for another year, and he considers no patient safe to stop mercury until at least two good years of treatment lie behind him, and until he has been six months exempt from any sign.

This mode is attractive on account of its precision, and I have had some cases under my care where it was carried out with most favourable results, but as I have already pointed out to you there is a danger of the disease acquiring

a tolerance for the drug, and of its action being thus diminished. Some suggest intermitting courses of mercury with a course of iodide between. For my own part I am doubtful of the utility of the iodides in the secondary stage except when the symptoms are very precocious, when I think their administration is absolutely essential to a rapid cure, or in those cases where we see syphilis implanted on a constitution where iodine would be given for the relief of the condition even if syphilis were itself absent.

The point that must next engage our attention is the different modes in which mercury may be administered, and here we find a considerable choice, for it may be given :

1. By the mouth. 2. By inunction. 3. By fumigation.
4. By hypodermic injection.

When giving mercury by the mouth the most generally useful preparations are grey powder, the green iodide, the perchloride, blue pill and calomel. The first mentioned is perhaps the best of all, the green iodide holds a high place also and is the preparation preferred by Fournier, but it is somewhat unstable, and apt to decompose, and its efficiency is thus impaired. The perchloride, although much used in France, is not to my way of thinking a reliable preparation and when given in sufficiently large doses is apt to induce intestinal disturbances. It is not unsuitable where only a slight action is required. Blue pill generally agrees well but it is somewhat uncertain in its effects, and calomel is chiefly used when a very rapid action is required as in cases of iritis. The bicyanide is approved by some, the salicylate of mercury is frequently used in Germany, and the tannate of mercury, which is not soluble

in hydrochloric acid but is highly so in the presence of alkalies, has been strongly advocated on the theory that it is absorbed by the intestinal membrane as readily as oleate of mercury is by the skin.

Although the statements which I have just made regarding the comparative merits of the different preparations of mercury are reliable in the abstract, still you must understand that there are exceptions to the rule, for you will meet with individuals, where, from some peculiar idiosyncrasy, one form will agree better than any other, that when the symptoms resist the influence of one preparation of mercury they will yield to another, and that when salivation is imminent the substitution of, say, the perchloride for grey powder, will serve to ward off mercurialisation, and at the same time exert a sufficient influence to dissipate the syphilitic manifestations.

Inunction is an old, a well-established and an undoubtedly reliable mode of treatment. It is much favoured in most lands, and in Germany it is much more relied upon than other method. Of its efficacy I have myself no doubt, and were it not for its troublesomeness and dirtiness, I am sure that it would replace all other plans.

It may be carried out in different ways, *e.g.*, the patient should have a warm bath for two nights to render the skin clean, and thus to aid absorption. Half a drachm of blue ointment or a drachm of five per cent. oleate of mercury should be well rubbed in while the patient sits before a fire. The rubbing should be continued for from ten to twenty minutes. In order to prevent irritation of the skin a different part of the body should be used each night, the

thighs one night, arms another, axillæ another and so on. In the great hospital at Vienna the patients sit in rows and give a literal and practical illustration of the old Scotch proverb, if I may alter one word, "If you will rub my back I will rub yours," but this is of course impossible in private practice. The patient should sleep in flannel with plenty of bed clothing, and should have a warm bath each second day. The rule with regard to the length of time or which inunction is to be continued during each course as laid down by Ernest Fiuger of Vienna, is that it should be kept up until the disappearance of the symptoms and for half as long again, *e.g.*, if twenty rubbings are required before an eruption disappears, then ten more should be practised and so on.

Mercurial fumigation has been warmly advocated by Mr. Henry Lee, who believes that it possesses many advantages over all other methods. He holds that it makes the least demand on the patient's system, that the amount administered may be regulated with the greatest nicety, that the action may be maintained for almost any length of time, and that the quantity used, although sufficient, is yet so small that the patient is not exposed to any sudden or violent effects. The method is undoubtedly a useful one, especially when it is desired to bring mercury in direct contact with some obstinate and troublesome skin eruption.

Mr. Lee employs a very simple lamp, such as you now see on the table. Twenty grains of pure calomel are placed on the little tin cup on the top of the lamp, and the surrounding



saucer is nearly half filled with boiling water. The wick is then lit, and the lamp is placed under a cane-bottomed chair on which the patient sits, covered with a mackintosh cloak or one or two blankets. During the process the patient should inhale the vapour two or three times by loosening the covering at the neck. The bath lasts for from fifteen to twenty minutes, at the end of which time it will be found that the calomel has all been volatilised, and that a thin film of the metal has been deposited on the surface of the body, which should not be rubbed off. The covering should then be removed, the night-dress put on, and the patient should go to bed. The bath should be repeated every night until the syphilitic symptoms disappear, and for two days longer. If possible the patient should remain indoors while the course is going on, he should at any rate do so during the first ten days of treatment by fumigation.

Professor Merget of Bordeaux has recently introduced a method as a substitute for mercurial inunction but which really partakes more of the character of the mode just described, *viz.*, Fumigation. He holds that during treatment by inunction the metal is not absorbed by the healthy skin, but acts only by the vapours which are evolved, and which are absorbed through the respiratory passages. He uses flannel impregnated with mercurous ammonium, a piece of which, about twenty-five centimetres square, is enclosed in a tissue bag so as to prevent the dusting out and inhalation of the mercurial powder; it is placed under the patient's head or on his chest at night, the result being that a continuous mercurial vapour is given

off, and is inhaled by the patient during the entire night. He states that this mode of treatment is well borne, that it is safe and trustworthy. Its simplicity will recommend it, and as the piece of flannel retains its powers for three weeks it is probably the cheapest method yet suggested.

The treatment of syphilis by intra-muscular hypodermic injections of mercury has recently been much practised, and those who have had most experience of it assign to it a very high place as a precise and certain mode of bringing the patient under the influence of the drug with a minimum risk of inducing toxic symptoms. It certainly has the recommendation of requiring by far the smallest amount of mercury, for eight grains will suffice for a course lasting for twelve months. It also possesses the advantage of extreme rapidity of action, and it is therefore extremely useful in cases of iritis and in some forms of cerebral syphilis where it is of the utmost moment to bring the patient under the influence of mercury as speedily as possible. Various preparations of mercury have been used for hypodermic medication, the essentials being to obtain a soluble and non-irritating salt. Probably the best are sal alembroth as employed by Mr. Bloxam, and the sozoidol of mercury strongly advocated by Mr. Edward Cotterell. Both of these are preferable to grey oil, which has also been much used. Mr. Bloxam's formula for preparing his solution is perchloride of mercury 32 grains, chloride of ammonium 16 grains, distilled water to 2 ounces, of which the dose is 10 minims. Mr. Cotterell suggests sozoidol of mercury 5 grains, iodide of sodium 10 grains, distilled water 200 minims. 10 to 15 minims of

this solution should be slowly injected into the muscular tissue of the upper part of the gluteal region once a week while the syphilitic manifestations last, then once a fortnight for three or four months, and after that a monthly injection will suffice. Care must be taken that the fluid is injected directly into the muscle, otherwise much irritation will result. It is advisable to use a platino-iridium needle, to see that the fluid is sterile, and to asepticise the skin by thorough cleansing with carbolic and turpentine before injecting.

We now come to the treatment of the symptoms met with during the tertiary period which is, as Fournier says, "the ending where the indifferent or negligent patient pays the heaviest debt to his malady, and syphilis is a hard creditor who does not accord grace to any one". During this stage the iodides of potassium and sodium are undoubtedly the most useful drugs, and their effects are often almost miraculous. Mercury is much upheld by many for the treatment of tertiary lesions, but although there are some rare cases where the symptoms resist the iodides and yield to mercury, still for the removal of the symptoms I invariably trust to the former, and I have as little doubt that for the prevention of further outbreaks the latter should be relied on. "Under the kindly influence of iodine, unsparingly pushed," says Keyes, "the node melts away, the gummy tumour becomes absorbed, the spreading ulcer flushes with healthy granulations, the palsied muscle regains its contractility, the veil drops from the clouded intellect, the maniacal paroxysm is followed by peace. No means in the physician's hands place him so near the Deity as the iodide of potassium. With it, in well-selected syphilitic cases, he

can sometimes almost effect a resurrection. Wasted and lost functions are restored; the mind, the memory, the speech, the hearing, the sight, the taste, the touch, all may be recovered by its aid, and no amount of destructive tertiary disease need occasion despondency, so long as the integrity of the stomach can be preserved, and the physician is strong in his faith in iodine, and expert in his methods of using it."

This may seem to be an unduly highly coloured picture, but its tints are by no means too pronounced, and its *ad naturam* character will be readily recognised and appreciated by any one who has had much experience of the almost miracle-working powers of iodine when used in the treatment of tertiary syphilitic lesions.

You must also remember that some patients cannot take iodine in any form without the immediate development of toxic symptoms; and during a prolonged course of iodine or the iodides various skin eruptions are sometimes met with; they assume different forms, such as the pustular, vesicular, bullous, urticarial, erythematous and purpuric. I have myself seen the most intense iodism follow a single five grain dose of iodide of potassium, the patient's face being so swollen that he was quite unrecognisable, both his eyes were completely closed by œdema of the lids, his tongue was so swollen that his mouth could scarce contain it, and saliva was constantly flowing from it in large quantity. Large beads of perspiration covered his forehead and there was a copious watery discharge from his nostrils. From the swelling of his mouth and throat the patient felt the greatest possible

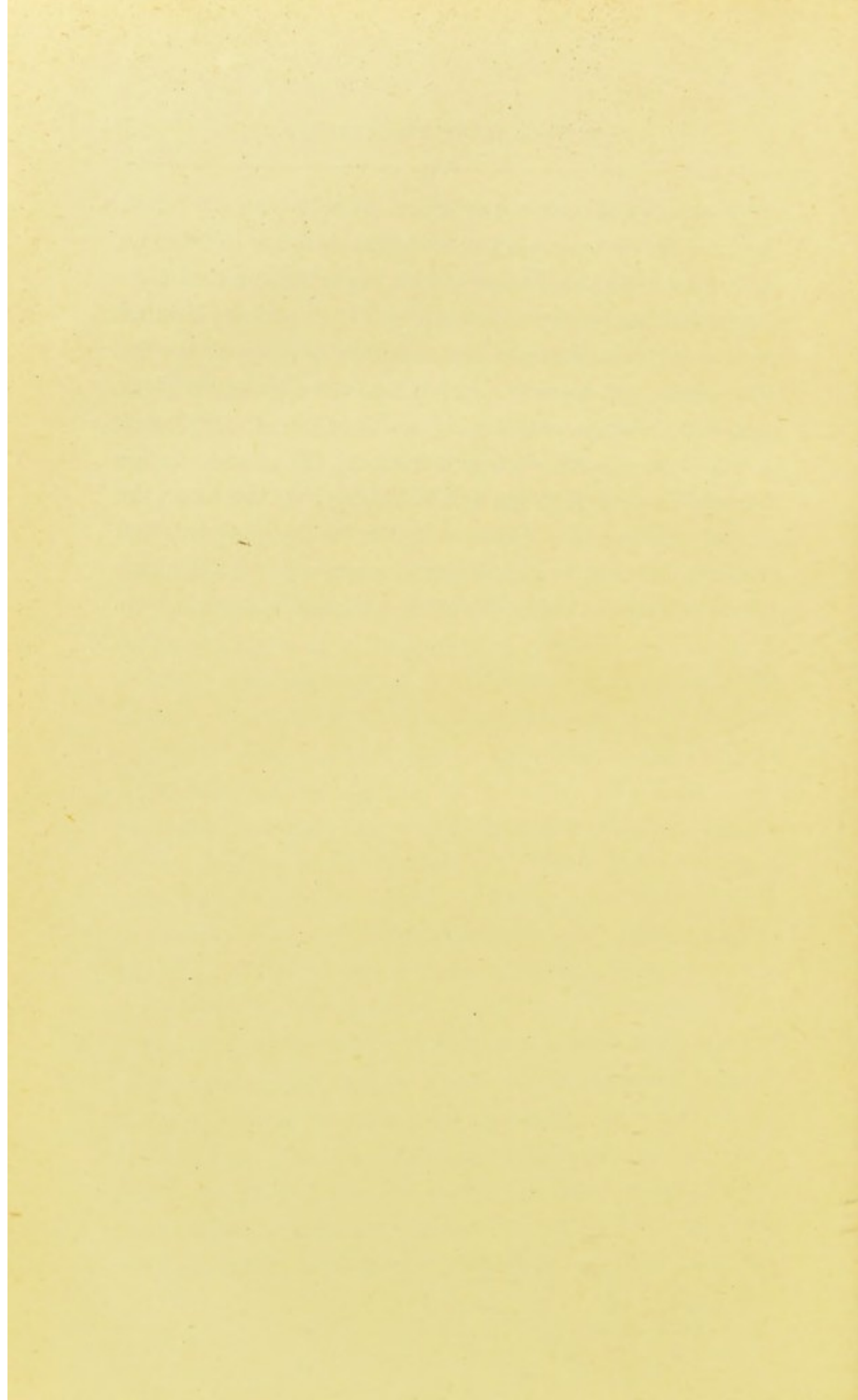
difficulty in breathing. His pulse was full and rapid, and his face much flushed. Next morning the symptoms had considerably abated, and by evening, with the exception of a very dirty tongue and some gastric and intestinal disturbance, he felt almost well. This is of course an extreme example of iodic poisoning, the ordinary symptoms being coryza, headache, a disagreeable taste in the mouth, a furred tongue, anorexia, and perhaps some gastro-intestinal derangement. Strangely enough these symptoms are mostly met with after small doses, and when larger ones are given the toxic symptoms cease. The generally accepted rule is therefore to double the dose if iodism appears; there are however exceptions to this, as to all rules. Sodium iodide is less likely to cause iodism than potassium iodide. Iodic acne which often appears after the drug has been taken for some time may be, in some measure, prevented by adding arsenic to the potassium salt. The addition of carbonate of ammonia is supposed to aid the action of the iodide, and the simultaneous use of diuretics undoubtedly enables a patient to tolerate the drug when otherwise it would disagree. Milk is one of the best vehicles for this medicine except where it is advisable that some bitter tonic should be combined with it such as calumba or chiretta. No absolute law can be laid down regarding the amount of the dose, for individuals vary so greatly in their tolerance of, and symptoms differ so much in their resistance to, iodine in its various forms. Five, ten, fifteen, and twenty grain doses given thrice daily may prove impotent, and if so the amount must be increased until the symptoms yield or until you are satisfied that they are not removable by iodides. This will, I feel

satisfied, be a very rare occurrence, for no therapeutic fact is more certain than that tertiary syphilitic symptoms will disappear under iodine treatment. I have myself often given enormous doses of iodide of potassium with the happiest effects, in one case the patient consumed half-an-ounce three times a day for several weeks, and he thrived on it. I would not however advise such heroic doses, and I cite it, not for your imitation, but to show you that the drug can be largely taken with impunity. It is difficult to lay down any hard and fast line as to the length of time during which the administration of the iodides should be kept up, but a safe rule is to continue it until the symptoms disappear and for half that length of time in addition. Only remember that there may be certain residual symptoms, due to incurable degenerative changes which, as Gowers has pointed out, instead of being benefited by iodine may be positively harmed by it, and there is no doubt that if it is too long continued the system will get accustomed to it and its influence for good will then be considerably lessened. Each case must be judged by itself, and in your treatment you must be guided by its exigencies. Sometimes it will be wise to stop the use of iodine, and substitute mercury, or to utilise the interval by giving a course of tonics, but any way, after you have done with the iodides, I would strongly advise a subsequent mercurial course for I believe that its prophylactic powers are far greater than iodine in any form or in any dose. Gowers advocates for every syphilitic subject a three weeks' course of iodide of potassium twice every year for at least five years after the last symptom has shown itself, and he believes that were this adopted grave

lesions would be much more rare ; but, holding, as I do, that iodine only removes the symptoms, while mercury cures the disease, I cannot help thinking that an occasional mercurial course, or a combination of the two, would probably be of far greater avail, and I am of opinion that no more suitable mode of carrying this on could be found than by the intra-muscular injections of which I spoke not long since. In this connection I may remind you of an old and well-tried preparation—Donovan's Solution—which you will often find useful when you wish to prescribe mercury and iodine in combination, and it generally agrees well.

I must now bring this imperfect sketch—for it is nothing more—of the routine treatment of acquired syphilis to an end, for time will not permit me to lay before you the diverse methods of topical treatment of the different manifestations of the disorder—interesting though they be—but I would just wish to say one word regarding a very important question that is being constantly and eagerly propounded by luetic patients, *viz.*, When is marriage permissible? It is a difficult question to answer but it cannot be evaded. Syphilographers give widely varying periods. Hutchinson and Schuster fixing the time at two years after the appearance of secondary symptoms ; while Fournier and Otis advise that four years should be allowed to intervene ; and Byrom Bramwell, Kopp, and Lesser fix five years as the interval that should be allowed to elapse. For my own part I generally warn patients that two and a half or three years is the earliest possible time at which there would be any safety in entering on wedlock, and then only provided that during the whole period they have been

under strict and efficient medical supervision, and that under no circumstances is any individual justified in doing so until at least one year has passed during which no syphilitic symptoms have declared themselves. If this advice is acted upon, and if treatment has been faithfully followed on the lines I have laid down, I believe that future immunity from syphilitic symptoms will be enjoyed by the individual, that he will be incapable of communicating the disease to his wife, and that his offspring will be healthy. If this be so, the treatment of syphilis is truly a matter of the most extreme moment, and one that will amply repay the efforts which are made in guiding the disease to a successful termination.



APPENDIX.

APPENDIX.

THE TREATMENT OF SYPHILIS.

TONICS.

R₇

Ferri Redacti gr. iiss.

Extracti Nucis Vomicæ gr. ss.

Ft. pilula.

Misce.

Sig.—One pill thrice daily.

R₇

Quininæ Sulphatis gr. xvi.

Ferri Sulphatis gr. xxiv.

Acidi Nitro-Hydrochlorici Diluti ʒivss.

Infusi Calumbæ ʒviiss.

Ft. mistura.

Misce.

Sig.—A tablespoonful in a wine-glassful of water three times a day.

R₇

Tincturæ Ferri Perchloridi

Spiritus Chloroformi

Glycerini aa ʒj.

Ft. mistura.

Misce.

Sig.—A teaspoonful in a wine-glassful of water three times a day.

TOOTH POWDERS AND MOUTH WASHES.

R₇

Pulveris Cretæ Camphoratae ʒj.

Potassii Chloratis ʒj.

Misce.

R̄

Pulveris Saponis gr. xx.
 Pulveris Myrthæ ʒss.
 Pulveris Cinchonæ ʒj.
 Pulveris Cretæ Preparatæ ʒiss.
 Olei Sassafras q. s.
 Misce.

R̄

Aluminis ʒj.
 Tincturæ Krameriae ʒss.
 Aquam ad ʒiv.
 Misce.

R̄

Potassii Chloratis ʒj.
 Aquæ ʒviii.
 Misce.

MERCURIAL PREPARATIONS.

R̄

Hydrargyri Iodidi Viride gr. $\frac{1}{4}$.
 Extracti Lactucarii gr. ij. vel Opii gr. $\frac{1}{6}$
 vel Extracti Hyoscyami gr. iij.

Ft. pil. Misce.

Sig.—One three times a day.

R̄

Liq. Hydrargyri Perchloridi
 Tinct. Cinchonæ Co. aa ʒiss.
 Misce.

Sig.—ʒij thrice daily.

R̄

Hydrargyri Perchloridi gr. j.
 Amyli ʒss.
 Misce.

Divide in pilulas xx.

Sig.—One pill three times a day.

Van Swieten's Solution of Perchloride of Mercury contains one and a half grains in two ounces of Corn Brandy or Spirit of Wine. Dose ʒj thrice daily in a mucilaginous fluid.

R̄

Pilalæ Hydrargyri gr. $\text{iiij.}-\text{iv.}$

Extracti Opii gr. $\frac{1}{4}$.

Ft. pilula.

Misce.

Sig.—One every night at bed-time.

R̄

Pulveris Hydrargyri cum Creta gr. ij.

Pulveris Ipecacuanhæ Co. gr. j.

Ft. pulvis.

Misce.

Sig.—One twice daily.

R̄

Hydrargyri Subchloridi gr. j.

Extracti Opii gr. $\frac{1}{6}$.

Ft. pilula.

Misce.

Sig.—One thrice daily.

COMBINATIONS OF TONICS AND SPECIFICS.

R̄

Hydrargyri Perchloridi gr. iiij.

Tincturæ Ferri Perchloridi ʒj.

Ft. guttæ.

Misce.

Sig.—Fifteen drops in a wine-glassful of water three times a day.

R̄

Hydrargyri Iodidi Viride gr. $\frac{1}{4}$.

Quininæ Sulphatis gr. j.

Nickeli Phosphatis gr. ss.

Ft. pilula.

Misce.

Sig.—One three times daily.

R̄

Hydrargyri Perchloridi gr. j.
 Ætheris ʒj.
 Solve et adde Olei Morrhuæ ʒiv.

Misce.

Sig.—A dessertspoonful three times a day after food.

MERCURY AND IODIDE OF POTASSIUM.

R̄

Hydrargyri Perchloridi gr. j.
 Potassii Iodidi ʒij.
 Infusi Calumbæ ʒviij.

Ft. mistura.

Misce.

Sig.—A tablespoonful largely diluted three times a day.

R̄

Hydrargyri Iodidi Rubri gr. j.
 Potassii Iodidi ʒj.
 Aquæ ʒj.
 Syrupi Simplicis ʒv.

Ft. mistura.

Misce.

Sig.—A tablespoonful thrice daily.

PREPARATIONS CONTAINING IODINE.

R̄

Potassii Iodidi vel Sodii Iodidi ʒj.
 Aquam ad ʒj.

Ft. guttæ.

Misce.

Sig.—Five minims thrice daily.

R̄

Potassii Iodidi
 • Ammonii Carbonatis aa ʒj.
 Tincturæ Cinchonæ Co. ʒiv.

Ft. mistura.

Misce.

Sig.—Two teaspoonfuls in a wine-glassful of water thrice daily.

R̄

Potassii Iodidi ʒij.
Potassii Acetatis ʒiv.
Aquam ad ʒviii.

Ft. mistura.

Misce.

Sig.—A tablespoonful largely diluted thrice daily.

R̄

Tincturæ Iodi ʒj.
Liq. Arsenicalis ʒss.
Aquam ad ʒij.

Ft. mistura.

Misce.

Sig.—A measured teaspoonful in a wine-glassful of water three times a day.

R̄

Hydrargyri Bicyanidi gr. ss.
Infusi Quassiæ ʒviij.

Ft. mistura.

Misce.

Sig.—An 8th part three times a day.

LOCAL TREATMENT.

FOR MUCOUS PATCHES IN MOUTH.

R̄

Liquoris Acidi Chromici ʒij.

Sig.—To be applied with a brush.

If used by the patient a solution of acetate of aluminium should be applied shortly afterwards.

FOR SUPERFICIAL ULCERS OF THROAT.

R̄

Hydrargyri Perchloridi gr. iij.
Aquæ Destillatæ ʒviij.

Ft. gargarisma.

Misce.

FOR RHAGADES OF MOUTH AND NOSE.

R₇

Hydrargyri Subchloridi ʒj.
Olei Olivæ ʒij.

Ft. applicatio.

Misce.

Sig.—To be applied with a camel's hair pencil.

FOR MUCOUS PATCHES AND TUBERCLES ROUND ANUS.

R₇

Hydrargyri Subchloridi ʒj-ʒij.
Zinci Oxidi ʒij.

Ft. pulvis.

Misce.

Sig.—To be dusted on the affected parts twice daily.

FOR PAPULES ON FACE.

R₇

Hydrargyri Perchloridi gr. iij.
Spiritus Vini Rectificati ʒiv.
Aquæ Rosæ ʒiijss.

Ft. lotio.

Misce.

Sig.—To be applied several times a day.

FOR TUBERCULAR AND OTHER ULCERATIONS.

Emplastrum Hydrargyri Carbolatum (Unna).

FOR PALMAR AND PLANTAR PSORIASIS.

Emplastrum Salicylicum.

To be followed by inunction of Oleate of Mercury.

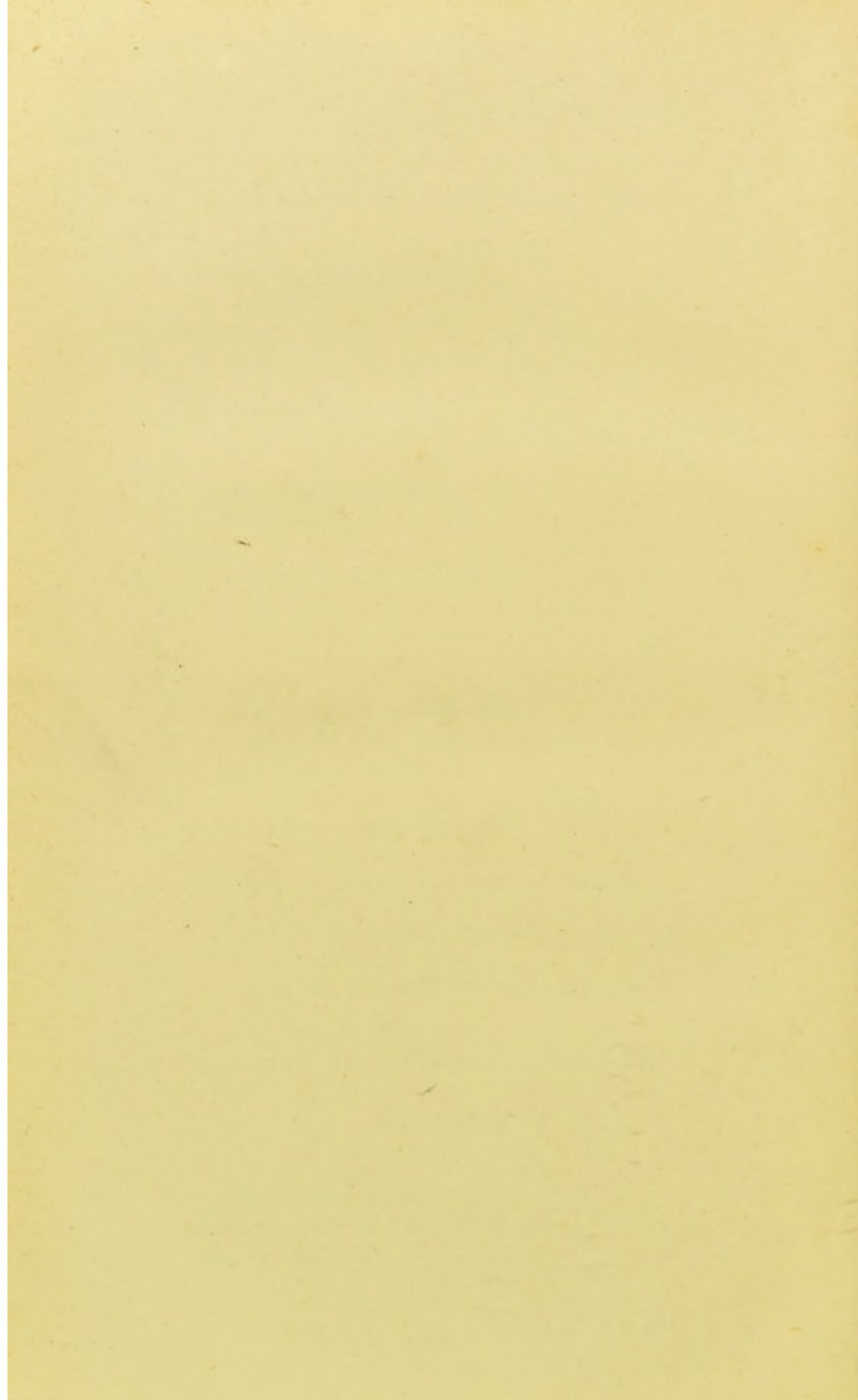
FOR ONYCHIA.

R₇

Plumbi Nitratis ʒij.

Sig.—A small quantity to be applied with a camel's hair brush
once or twice a day.

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