ART. III.—*Observations upon Urinary Fistula*. By WILLIAM COLLES, F. R. C. S. I., Surgeon to Dr. Steevens's Hospital.

THE term urinary fistula is applied to that form of disease which consists in a communication existing between the canal of the urethra and the external surface, by means of a fistulous passage; and as this fistula generally opens in the perinæum, the disease has been termed "*fistula in perinæo*." But we must at once perceive the impropriety of adopting a name which would render necessary the division of a disease into two classes, differing from each other only in a very trivial and unimportant point; for whether the fistula opens in the perinæum or scrotum, over ramus of the pubis, in the thigh, or beside the sacrum or anus, —in all of which situations the external opening has been found, —it can make little or no alteration in our diagnosis or treatment.

Of these urinary fistulæ we may distinguish two very distinct forms: one having its origin in a purely local cause, and the other constitutional. The former may arise from an obstruction to the free passage of the urine through the urethra; and as it is that form which is chiefly noticed by authors, we shall first consider some points in connexion with it. This obstruction may be caused either by a stricture of the urethra; or it may be a consequence of rupture of the canal, which, being torn across, has been allowed to unite obliquely; or it may arise from a total obliteration, owing to sloughing or ulceration of a portion of the canal.

When the fistula is a consequence of stricture, it is generally found in those cases in which the stricture has been neglected, allowed to become very firm, hard, and close, or when it has been improperly treated by the too frequent or too forcible introduction of instruments, or by the incautious application of caustic.

The disease commences by the formation of an acute ab-

scuss, attended with considerable fever and constitutional disturbance, increased frequency in the calls to pass water, and increased difficulty and straining in evacuating the bladder, attended with severe scalding pain in some one spot of the urethra. The patient complains of a considerable swelling in the perinæum, which prevents the urine flowing, and obliges him to keep the legs wide asunder, as any attempt to close them would be attended with great suffering from the pressure on the abscess. Hence he must lie constantly on his back, with the knees flexed and far apart. On examining the part, we find a general fulness in the perinæum, not amounting to a circumscribed tumour; sometimes a blush of redness, but often no discolouration of the integuments. No sense of fluctuation is afforded to the fingers, but rather a boggy feel, amounting at times to that œdematous state which retains the impressions of the fingers. The abscess, being bound down by the fascia, wants the distinctive marks of a common superficial abscess.

Here we cannot wait for the abscess to point or become more evident, we must open it at once and freely. The urine will pass through the incision, sometimes immediately after, and sometimes not for two or three days.

The opening gradually closes, till there only remains one large granulation through which the urine flows; the parts round the fistula become consolidated and hard; the skin puckered, giving the appearance of a neck round the orifice; and the fistula comes to be lined with a peculiar membrane, and is permanent.

The theory offered to explain the formation of the abscess is this, that from the narrowing of one point in the urethra, and the consequent increased force required to evacuate the bladder, the urethra comes to be dilated immediately behind the stricture; that here a drop or two of urine constantly remains; this produces irritation, and finally ulceration, in the

spot; that the urine escapes through this ulcer into the cellular membrane beneath, disorganizes it, and thus causes the abscess.

This theory may explain the origin of this abscess in many cases, but it cannot apply to all. Thus we at times find the internal opening of the fistula to exist on the upper or pubic surface of the urethra. Again, we often find it at a considerable distance behind the stricture and the dilated portions of the urethra. If this explanation were true we would have the pus, when fully formed, passing through the urethra, and the case often ending in the formation, if we may be allowed the term, of a "blind external fistula." We should also much oftener have extravasation of urine, for the abscess causes increased straining, and increased difficulty in the evacuation of the bladder, and, if the ulcerated opening exists, it must afford a ready exit to the urine. Neither can it account for the fact, that we in general do not find urine pass through the incision till two or three days after the abscess is opened. Or again, why is it that the abscess, when opened, will sometimes heal and remain closed, no urine passing through it!

We are told that the disease, when fully formed, is easily distinguished, by a red papilla in the perinæum, with surrounding hardness; and that when the patient passes water the urine will be seen to flow through it. This is not, however, always the case, for the fistula may open near the anus, and be so small and tortuous that the urine will not appear externally till some time after the act of micturition shall have ceased. We have known a patient make water before leaving home, and not perceive any urine pass through the fistula till he had walked two or three streets, and we came to examine and make pressure on the fistula.

My father was in the habit of relating a case in which he could not discover, on the closest examination, any fistulous opening; when the patient undertook to convince him that such really did exist, he wiped the perinæum dry, applied a

piece of blotting paper to it, passed water, and then shewed the stain on the paper: the quantity could scarcely have amounted to a drop, and the opening could not be seen, yet the man suffered as much annoyance as if the disease was much more extensive.

In examining these fistulæ we cannot, as in fæcal fistula, rely on the probe as a satisfactory guide; for though it will sometimes pass through the external opening and touch a solid instrument in the urethra, yet, in the majority of cases, the course of the fistula is so tortuous, and leads off in a direction so distant from the urethra, that no probe can follow it in all its windings. Hence arises the great difficulty to trace and discover the exact situation of the internal orifice of the fistula, which, if we could find, would often afford us most material assistance in our further proceedings.

In speaking of the treatment of the disease, surgeons tell us that the urine, constantly flowing through these fistulæ, alone prevents them from closing; and, therefore, it will be necessary to prevent this, and that it can only be effected by causing the urine to pass through a hollow instrument, either constantly worn in the bladder, or introduced every time the patient wishes to pass water: and that this and this alone can effect a proper cure. This is certainly a severe method of proceeding, and not always necessary or successful; and by it we confine the patient to his bed or to his home for five or six weeks, and we often find his health become seriously impaired from the confinement. The constant presence of the instrument causes irritation, inflammation of the bladder and urethra, frequent calls to pass water, straining, and mucous deposits, with some streaks of blood in the urine. If we still persist in retaining the instrument, the patient is likely to be seized with that form of fever denominated "urinary fever," a most severe and often dangerous complication. If we resort to the introduction of the instrument every time the patient wishes to pass water, we often find we do more harm than good: we

irritate the urethra, the introduction of the instrument becomes more difficult, and we find, after a time, the stricture much increased in extent, irritable, and close, or that, perhaps, other strictures and fistulæ have appeared.

Hence I would say, that as the stricture is the cause of the fistula, we should direct our chief attention to the removal of it by the simplest means : if we introduce a catheter or bougie perhaps every second or third day, we will find that according as the stricture is dilated the fistulæ will close, less urine passing through them each time. If we find this method fail, after a fair trial, we can then resort to the constant wearing of a catheter, when the urethra will have become more accustomed to its presence.

It has been at times found that even where the catheter has been constantly worn, the fistula has made little or no progress towards healing, although the urethra has been fully dilated, and not a drop of urine has passed through the fistula for several weeks. Here, if we remove the catheter, and allow the patient to go about, we will find, when, perhaps, we are considering about our further proceedings, an evident improvement in a few days ; the discharge both of urine and pus from the fistula becomes less, the surrounding hardness disappears, and the case goes on to a complete cure.

We are by some recommended, in order to expedite the closing of those fistulæ, to use various caustic applications ; but if we use a solid caustic we find we cannot get it much farther than the external opening, as the canal is so small and tortuous ; and to be effectual it should be applied to the internal opening. And when we consider the course of these fistulæ, and the force that would often be required to drive an injection to the urethra, a surgeon would dread the fluid caustics becoming extravasated into the cellular membrane, and producing incalculable mischief.

Reasoning from analogy of fistulæ in ano, we have been told to divide these fistulæ into the urethra, and make them

heal from the bottom ; but we will find very little analogy between the two operations, and besides, we cannot find, and therefore cannot divide, the internal orifice of these fistulæ.

The various methods recommended will sometimes fail in effecting a cure of the disease, and we are obliged to resort to an operation. This may become necessary, either from the nature of the obstruction preventing the use of an instrument,—being one of those strictures which close so rapidly as to lose, in one or two days, the labour of weeks ; or of that broad, cartilaginous kind, which will scarcely yield to any instrument ; or from the continuity of the canal being completely interrupted, either from the total want of a greater or less extent of urethra, from sloughing or ulceration ; or from the torn ends of the canal having united obliquely and irregularly : or it may become necessary from finding the patient's constitution suffering, urinary irritation succeeding, fresh fistulæ forming, and, perhaps, diseased bladder threatening, in consequence of the continued existence of the disease. From reading the works of authors we would be led to suppose the necessary operation a simple one, and easily performed, yet when we come to practise, and see the practice of others, we find it to be a most tedious and difficult proceeding ; and we have known the patient put to bed, after being on the table a great length of time, the surgeon not being able to attain his object.

In this the great, and sometimes unattainable object, is to reach the urethra behind the stricture, when an instrument will not pass the obstructions from before. Here we have nothing to guide us to the part. Our knowledge of anatomy is of little avail, the parts are so thickened, hard, and altered in structure,—being often like cartilage,—that they close on the knife after each incision : if we dilate the wound by means of spatulæ, we can only apply them to the superficial integuments ; —the urethra does not form a rounded tube, it is contracted, the opposite sides lie in close contact, and can with difficulty be distinguished. The corpus cavernosum of the penis, a fis-

tula, or even the ramus of the pubis, have been cut on, and mistaken for the canal.

We have been told to pass a staff down to the stricture, cut on this, and then divide the stricture: but when the staff is held pressed on the stricture, our incision sets it free, it slips out of the urethra, and we cannot again apply it to the exact spot it previously held. This plan may, however, succeed when we have a skilful and attentive assistant, who passes the staff to the stricture, draws up the penis well upon it, and then steadily presses the staff, not on the stricture, but against the arch of the pubes; thus, when we cut on the end of the staff, the parts remain fixed, and the staff and stricture retain their relative position; we then direct the edge of the knife so as to divide the stricture beyond the point of the staff, and we sometimes find that the instrument will then readily pass on to the bladder.

Again, we are told that we will reach the urethra by following the course of the fistulæ; but they are often so tortuous, and in such number, that no probe or knife can follow their windings.

When the fistula is single, and all, or most, of the urine passes through it, we will, at times, be able to dilate the fistula till we can pass a small gum elastic catheter into the bladder, and then proceed to the further steps of the operation. My colleague, Mr. Cusack, lately succeeded in restoring, by this means, a urethra which had been previously torn across by a fracture of the pelvis.

When we cannot, by any of the methods recommended, find the urethra behind the obstruction, we must resort to a more tedious operation. We place the patient as in the operation of lithotomy; use no staff or instrument in the anterior portion of the urethra; let an assistant hold up the penis and scrotum, but make no pressure; leave the parts as much as possible in their relative positions; make a free incision along the

raphe of the perinæum; deepen the incision by cutting always in the same line till we have got through a depth of parts previously calculated on, recollecting that the apparent depth at which the urethra lies is much increased by the hard and unyielding nature of the altered structures through which we cut. Sometimes we will feel, by the want of resistance to the point of the knife, that we have entered the urethra; often we have not even this to guide us: however, having carried the incision deep enough, we proceed to search for the urethra. The eye will seldom be able to distinguish it at the bottom of the incision; sensation, conveyed by the finger, or a bent probe, will often inform us if we have to cut deeper, or the probe may enter the opening in the urethra, and pass on to the bladder. We are told, by desiring the patient to pass water, that we will perceive the opening in the urethra, if it has been effected; but it is seldom that a patient, suffering under a protracted operation, can direct his attention to exert the combined actions necessary to this evacuation, and even if he did, we can see the urine welling up, and filling and overflowing our incision, but we fail in seeing the opening in the urethra from which it issues. Having got the probe passed, and on it directed a gum elastic catheter, into the urethra, behind the stricture, the remainder of the operation is, comparatively, simple. Pass a probe from the incision up the urethra, till we arrive at the obstruction; then introduce a staff into the anterior portion of the urethra; divide the parts between the two instruments, until one will freely pass into the portion of canal occupied by the other; then cut off the head of the catheter, which is lying in the bladder, fix this anterior portion of the catheter to the end of the probe, and thus pass it through the orifice of the penis. In two or three days' time we will be able to introduce a larger instrument into the bladder, the stricture will be removed, and the parts will heal gradually and firmly.

Such is the form of fistula arising from obstruction, generally the only one, noticed by surgeons(a). Yet we often meet with the disease arising from a local cause, but not from stricture. In a former communication I related some cases where fistula was connected with disease of the prostate gland, and there a large-sized catheter would readily pass. Fistula is seen connected with ulcerated opening of the neck of the bladder, and other diseases of that viscus, or with a large abscess situated between the bladder and pelvis. It has followed, at times, some rough or awkward introduction of instruments, where there has been reason to fear a false passage has been produced. We also have seen fistulæ where no cause could be assigned for their appearance. This latter form generally arises far back in the urethra, runs close to the rectum, and will sometimes open into that viscus, and thus materially add to the patient's sufferings; for every time he goes to pass water, some of it will escape into the rectum, and will either run down the thighs, or the patient must evacuate it as if at stool.

In this form of disease, of course, our first endeavour should be, from the symptoms, and an accurate examination, to discover the original disease, and try to remove it, for till it is cured little can be done with the fistula; till when our efforts to remove it by the ordinary methods will, we regret to say, too often fail.

We will sometimes succeed by making the patient wear the catheter; sometimes the operation will cure it. And here the proceeding is simple, for we can readily pass a staff into the bladder, and thus have a sure and evident guide to our incision; we can readily divide the fistula and urethra, and make the wound heal from the bottom. Yet in this form of fistula the operation must oftener fail than in the former case. It may heal for a time, but will be liable to return on the slightest provocation.

(a) Dublin Journal of Medical Science, vol. xxvii. p. 372.

I relate the following as a well-marked case of some of the difficulties attending this form of disease.

Mr. D., aged 45, has been for twenty years labouring under urinary disease, which he attributes to a surgeon who treated him for stricture, forcibly introducing the catheter, and making a false passage, since which time he has however enjoyed months of comparative ease, followed by weeks of urinary irritation. His present attack commenced, two or three weeks since, by rigor, followed by profuse perspiration, and passing large quantities of purulent mucus, with great pain. The urine flowed, not in a stream, but drop by drop, with such straining as often to bring on a discharge of the contents of the rectum; this was followed by a swelling in the perinæum, close to the anus. It was opened, and in a few days the urine passed through it. He then complained of what he called a spasm of the rectum every time he passed urine; this was very severe, and would last two or three minutes; soon after he found some urine pass into the rectum, so that it either ran down his legs, or he was obliged to pass it off as if at stool. In London, Sir A. Cooper taught him to pass the catheter himself. During all this last attack he could pass a full-sized silver catheter, No. 12, with the greatest ease, but he remarked, that before the instrument reached the bladder, the urine would pass off, and most of it through the fistula. He then endeavoured to keep the gum-elastic catheter in the bladder, but he now found, no matter what was the size of the instrument, that towards the end of the evacuation he would be forced to strain, and the urine would pass by the sides of the instrument through the fistulæ.

These means failing, the operation was had recourse to. A large staff was introduced into the bladder, the fistula and urethra divided on it, the incision carried on to the prostate gland, and the wound made to heal from the bottom: yet it was not till some time after that the parts became consolidated.

Having now described the form of fistula which arises either from obstruction to the free passage of the urine, or

where the urethra is free, still has a local disease as its cause, I will next proceed to consider another form which was first noticed by my father in his clinical lectures, and has not received the attention it merits. It differs materially in its symptoms and treatment from those already mentioned, which may be considered as local: this form being more intimately connected with a deranged constitution.

If the patient be an intelligent man, who can give a clear account of his disease, we learn from him that the formation of matter in the perinæum was not attended with any inflammatory fever, nor with the throbbing, severe pain usually attending acute abscesses; but he will tell us that he, perhaps, occasionally noticed some scalding in micturition, some small tumour in the perinæum, which did not give him much uneasiness, or attract his attention; and that the progress of the abscess was slow, a considerable time existing between its first appearance and its opening. At times the patient will have no knowledge of the existence of the abscess till it bursts, or arrives to a very considerable size. He will tell us that he enjoys good health, but on a closer inquiry we will find that he has been for some time in a low, feverish state. His pulse is much quickened; he has considerable thirst, with slight impairment of his appetite, and loss of flesh, probably more remarked by his friends than by himself; when questioned, he often declares himself in perfect health; the countenance is pale, with, probably, a tinge of yellow; the nails do not exhibit the healthy state of the subjacent part, but resemble a thin, transparent layer of ivory, laid on a surface of a purple hue. In many such cases there is some affection of the chest, generally cough, with copious expectoration, some distress in breathing, particularly when attempting any extra exercise.

If we turn our attention to the local appearances, we observe the orifices of the fistulæ rather patulous, but no fungous papillæ projecting from them; there is very little hardness round the openings, or leading from them; and no puckering

of the skin, forming a kind of neck round the orifice. They generally exist in great numbers externally, and appear as if punched out of the skin; but we seldom find more than two openings internally. If we introduce a probe into one of the openings, we find it passing away from the urethra; often, from the same opening, it will run in different directions. When we come to examine the urethra of the patient, we cannot discover the existence of any stricture; and we can pass a full-sized catheter into the bladder without meeting any obstruction. Such is the history we receive from the patient, and such are the symptoms we observe in the form of disease, and we see that in both respects it differs materially from that previously described. In the one the general health is good; the abscess commences with inflammatory fever, is acute in its course, and causes much suffering; the fistulæ are few in number, marked by a red fungous papilla; there is an impediment in the introduction of a catheter, or evidence of some other local disease. In the other the health is much impaired; generally old chronic cough, with expectoration, is present; a low, sinking feverishness exists; the abscess is chronic, continuing for a long time, often unnoticed till it opens; the fistulæ are in great numbers, presenting merely wrinkles or perforations in the skin; the urethra is so free that a large catheter will pass readily into the bladder.

If, according to the generally received opinion and established rule of practice, we were to promise this patient to effect a cure by making him wear a full-sized catheter in the bladder, with the view of keeping the fistulæ free from any passage of urine, we would certainly have to suffer the mortification of a disappointment.

Should the surgeon be rash enough to undertake any operation with a view to the cure of the fistulæ, he would not only signally fail, but would render the state of the patient worse than before. We have known a surgeon operate in such a case, and the patient return to the country, the urine flowing

through the large wound, which had not made the slightest effort to heal. We regret that we have no mode to guide us to the successful treatment of these cases. Of course, on first visiting the patient, the surgeon is tempted, both for his own satisfaction and also his patient's, to introduce a catheter; but even this proceeding requires caution, for we know that in such broken-down constitutions this operation, performed as carefully and gently as possible, has excited urinary fever, and even led to a fatal termination. Having satisfied ourselves as to the state of the urethra, we should be cautious how we repeat the operation; for if the catheter be introduced too frequently, even should the patient escape the urinary fever, still we may induce an irritation, and unhealthy action in the urethra, which may give rise to stricture.

Our local applications will, therefore, be more with the view of alleviating the sufferings of the patient, and allaying local irritation and inflammation. If we direct him, each time he goes to pass water, to make pressure on the part, or to keep a moderate constant pressure on the fistulæ, so as to prevent so much of the urine passing through them, we will find, after a time, that some of them will become much smaller, and even close. This, and the occasional introduction of the catheter, at long intervals, should be our principal local remedies. Our chief reliance, however, must be in an improved state of the general health, and the removal, or alleviation, of the cough by those various means used in such cases, and which it is not our province here to mention.

Should we be so fortunate as to effect the removal of this, and restore the patient to good health, we shall find that the fistulæ will close almost without any local treatment; if not, we will have him in a condition to bear the application of such other measures as we would expect to succeed.

We will find, in too many of those cases, that the chest affection, or other organic lesion, will go on, and in the end, phthisis, or hectic fever, will carry off the patient.

By way of illustration I select two out of a number of cases of which I possess full notes, both being examples of this form of fistula, though differing in many minor points.

Mr. E., aged 40, an active, country gentleman applied to me some time ago. On removing a large linen cloth which was wrapped round the penis and scrotum, and wiping away a most profuse discharge of purulent matter, I saw a number of fistulous openings, commencing at the glans penis, and extending to the anus, six or eight in front of the scrotum, and from fifteen to twenty behind it: they appeared as if punched out of the skin. When he passed urine some of it flowed through each of these openings, and was a cause of considerable annoyance, but he did not complain of any painful condition of the parts. He was naturally of a dark yellow complexion; this now contrasted strongly with the pearly whiteness of the tunica adnata of the eye; the nails were of a purplish colour, and much curved; he was naturally of a spare habit of body, but was now perceptibly wasting in flesh; breathing not much disturbed, yet he had a good deal of cough, with a copious, free expectoration; pulse very quick; had much thirst; appetite, however, good. He gave a very indistinct account of the manner in which the complaint began; he never had any retention of urine; the formation of the abscess took place without any severe inflammation or pain in the parts.

He was most anxious to commence a course of bougies, having been told by his surgeon in the country that this would effectually cure him. After the occasional cautious introduction of the catheter, I determined to leave it in; and confined him to bed. After some days his lungs became more oppressed; fearing to persevere, I allowed him at first to move about the house, then to enjoy carriage exercise, at last to walk about with the instrument in the bladder; his cough evidently improved, though he exposed himself to cold and wet during the winter.

For nearly five months matters went on thus; the fistulæ

shewed no amendment, though the urine invariably passed entirely through the instrument; he refused to leave town, or to learn to pass the catheter for himself.

About this time, on changing the instrument, I observed that the linen which he kept round the genital organs appeared much less imbued with matter; and he said he remarked the same thing himself during the previous fortnight.

On each subsequent change of the catheter we remarked the further decrease of the discharge, and the lessening and final closure of the fistulæ. On closely observing the general health, I could also here perceive an amendment. The cough was less troublesome, the expectoration less copious, the circulation less languid: and that he had put up some flesh. In a short time the fistulæ were perfectly healed. He hunted regularly that winter; and soon after got married, and has had no return of his urinary complaints.

Here is a case of fistulæ existing to an enormous amount, without stricture, or other local disease; the local treatment did neither harm nor good; but when the general health began to improve, the fistulæ commenced to close at the same time. The very slight disturbance which the constant wearing of the catheter produced, is also very remarkable. The parts and the constitution seemed perfectly insensible to its presence.

Mr. K., aged 58, applied in July, 1845. Naturally of a spare habit; life sedentary; for many years subject to cough, attended with profuse expectoration. Says that twenty years ago he had been subject to stricture, and was since in the habit of passing an instrument for himself occasionally, but had neglected it the last winter. About a fortnight since, on going to London, he was much distressed during the passage by frequent discharges of urine and fæces. Next day he was obliged to pass water every half hour; and at Birmingham he was seized with retention of urine. He now, for the first time, perceived a tumour in the perinæum; the catheter was readily passed, the urine evacuated, and the abscess was opened. He then returned to Dublin.

When I saw him the greater portion of the urine passed through the fistula; there was a considerable discharge of matter from the urethra; and the calls to pass water were very frequent. I readily passed a middle-sized catheter into the bladder; this was followed in the evening by a rigor, and profuse perspirations; I introduced the catheter easily again in eight days, and repeated it occasionally till August, when the quantity of urine passing through the fistula was much diminished. He went to the country for six weeks, where he had a bougie passed almost daily. I now found the urethra, at the site of the fistula, had contracted so much that only a small catheter would pass. The cough considerably improved; but during the winter following it returned with increased severity, and finally proved fatal.

This case is worthy of recording, as shewing the very insidious manner of the formation of those abscesses, for the patient did not perceive it till a few minutes before it was opened; it also shews us that the catheter may be introduced too frequently, and do much mischief.

Thus we perceive that there are two distinct kinds of urinary as of fæcal fistulæ: one form local, acute, and requiring active treatment, and often operation; the other, depending on the deranged state of the constitution, not permitting much local interference, and entirely forbidding any operation for its cure. It can only be relieved by constitutional treatment.

ART. IV.—*The Propriety and practical Utility of classifying Hooping-Cough among the Exanthemata, with a new Theory of that Disease.* By JAMES F. DUNCAN, M. D., F.K. & Q. C. P., Extra Physician to Sir Patrick Dun's and Mercer's Hospitals; Lecturer on the Practice of Medicine in Park-street School, &c.

It cannot be denied, by any one at all acquainted with recent medical writings, that very little attention has been given of