the urethral canal is, however, easily ascertained by the use of a bulbous-ended sound, whose head is grasped by the sphincter vesicæ, enabling the exact distance from the outlet to be measured by the finger in the vagina. If the hymen is unusually complete, urine is passed into the vagina and passes very slowly out over the hymen. I recently saw a case where the posterior fourchette or anterior margin of the perineum was continued forward almost to the clitoris, causing similar symptoms.

The main symptom of defective formation is incontinence, and this is absolute if the sphincter vesicæ is absent, but slight where the defect is only in the lower parts of the urethra.

Atresia of the urethra may also be complete or partial, the resulting symptom being, of course, retention of urine. This retention leads to a retrograde distention of the bladder, ureters, and kidneys, and causes death *in utero*, or soon after birth, the only escape from this result being where the urachus remains patent and urine passes along it from the bladder through an umbilical fistula. If no water be passed in the twenty-four hours after birth, a careful examination should be made, and if everything appears normal a catheter should be passed, as it not infrequently happens that no urine is being secreted, or it is so loaded with urates that, whilst causing great irritation, it cannot be passed. If no opening into the bladder be found, and especially if vesical distention be evident, a channel must be made and kept open, either in the proper position of the urethra or above the pubes.

FUNCTIONAL DISEASE OF THE URETHRA.

I have named two varieties of functional disease in the table. It is, however, very doubtful whether *neuralgia* exists apart from organic disease either of the urethra itself or of some organ in its neighborhood. I have also seen cases where so-called neuralgia was entirely due to very acid urine, the result of dyspepsia and gout, and speedily relieved by ordinary therapeutic remedies.

Spasm also is usually superadded to true organic mischief in the urethra or elsewhere in the pelvis, and, so far as I have been able to judge, is never present in hysterical retention, which is mainly due to spasm of the sphincter vesicæ muscle, or to a temporary failure of the normal polarity of the vesical muscles.

ORGANIC DISEASES.

The first of this group is *inflammation.*

Urethritis in the female is much less common and much less severe than in the male, owing partly to the urethra's protected position, but mainly to its shorter length, greater diameter, and straighter course, so that its irrigation is more effectually secured at each act of micturition. There are also fewer lacunæ to harbor irritating or infecting products. The diagnosis of urethritis is easy. After vulvar sponging, pass the finger (not immediately after the woman has micturated) into the vagina, and the urethra can then be felt along its roof to be tender, swollen, and hard, and, on gentle pressure from behind forward, pus is seen to ooze out of the meatus externus, stained, maybe, with blood in acute cases.

Simple acute urethritis is very rare as a primary manifestation, being then due to injury, or sometimes to irritating urine affecting a urethra already granular or dilated, and a course of sedatives, alkalines with purgatives, such as hyoscyamus, buchu, citrate of potash, and Epsom salts, will usually put things right. Direct local measures are rarely called for, but hot hip-baths or hot vaginal douches are often useful. Where simple acute urethritis occurs secondarily by extension of inflammation from the vagina or the bladder, its treatment will be merged with that adopted for the primary disease.

Gonorrhœal urethritis is usually said to be more severe than the simple acute form, but this is incorrect, for a gonorrhœal vaginitis or vulvitis, one of which is almost always the primary manifestation of the disease, may be extremely mild, subacute, or chronic, sometimes being entirely unsuspected by the individual affected. Indeed, it is not rare to find that the only symptom noticed at the time, or recalled afterwards, is the scalding during micturition common to all forms of urethritis at their onset. If there is a history of gonorrhœa or gleet on the other side of the house, the diagnosis is easy, but this history is often not forthcoming, nor is it wise, as a rule, to endeavor to obtain it. The presence of gonococci in the urethral or vaginal pus is also a definite proof of gonorrhœa, and the presence of an acute metritis, salpingitis, and perimetritis is strong presumptive evidence to the same effect, especially if there is a history of such attacks having been recurrent.

In chronic urethritis, a chronic endocervicitis, with a dilated or matted pair of Fallopian tubes, points to a specific origin, but by no means so certainly as was once thought, it being abundantly clear now that a simple vaginitis may cause endocervicitis, endometritis, and salpingitis very readily if the vaginal discharges are allowed to become septic. As a rule, a gonorrhœal urethritis needs no active treatment other than that adopted for the vaginitis, for gonorrhœa in the female attacks almost entirely the generative tract, rarely spreading along the urinary as in the male.

Very good results are obtained by salicylic acid in fifteen-grain doses every four or six hours, and better still by salol in ten-grain doses. The latter is broken up into salicylic acid and carbolic acid, and carboluria may become evident in a couple of days. The urine should, unless contra-indicated by kidney-disease, be allowed to remain slightly colored by it until the urethritis is cured.

If urethritis tend to become chronic, no matter whether simple or specific in origin, a moderate antiseptic dilatation of the urethra by graduated bougies, such as Hegar's, may be effected; and if this does not suffice to cure, dilatation followed by the application of a rather strong solution of nitrate of silver (ten to twenty grains to the ounce) along the whole urethra, through a Bryant's or Reeves's speculum, will often cure a chronic urethritis at once. It is a good plan to keep in a Goodell's retention-catheter for thirty-six or forty-eight hours after doing this. Some prefer injecting about ten drops of a weaker solution of nitrate of silver, or of sulphate of copper or of zinc, into the urethra, either directly or through a reflux syringe; but the mucous folds and glands are not reached unless dilatation is first adopted, and the catarrh is then apt to recur constantly.

In very obstinate cases of chronic urethritis, where the mucous membrane is much thickened and thrown up into ridges, Emmet's button-hole operation, to be afterwards described, may be required.

Inflammation of (Skene's) Urethral Glands.—These glands are almost invariably involved in urethritis, and often remain inflamed after the urethritis is cured. They cause a fulness at the lateral aspect of the urethral orifice, exude a thin purulent fluid, and lead to dysuria and dyspareunia, and sometimes to vaginismus. The diagnosis has to be made from uncomplicated urethritis on the one side, and from vascular caruncle, if there is much bulging at the urethral orifice, on the other.

The treatment is to pass fine probes into the exposed orifices of the ducts and lay the ducts freely open posteriorly. Immediate union is prevented by freely applying tincture of iodine to the part. A cure is thus almost always effected.

Granular Urethra.—The female urethra is occasionally the seat of patches of so-called granulation, the pathology of which is doubtful. They may be almost painless and simply cause pruritus at the external meatus, or they may be exquisitely sensitive, causing terrible pain during micturition and rendering a complete examination impossible without local or general anæsthesia. Indeed, local anæsthesia, even by injecting two or three drops of a twenty-per-cent. solution of cocaine

on each side of the urethra, often fails to control the agony caused by the passage of a sound along the urethra. Nothing short of dilatation will render the diagnosis certain and at the same time render the local treatment easy. After partial dilatation by a Reeves's or Bryant's speculum or by Hegar's bougies, anæsthesia being carried just as far as the abolishment of the palpebral reflexes, the passage of a sound along the urethra to the point where the granulations begin will at once set up a pelvic reflex. A better way still is to have a strong illuminant, such as electric light, so that the color of the urethral lining may be noted through the gap in the side of the speculum. If no force has been used in the dilatation, so that bleeding has not occurred, a small-sized glass test-tube passed into the urethra enables a good view of its whole length to be obtained if a strong light be present. Skene's endoscope is practically a test-tube with a small movable mirror resembling a laryngeal mirror to throw the light on all points. Having thus seen where the patches of granulation are, the test-tube is withdrawn, a Bryant's speculum introduced, the granulation scraped with a very small ear-curette, and either pure carbolic acid or nitrate of silver solution (ʒi to ℥i) applied. Sometimes, if the patches can be readily brought into view, the galvanic cautery is the most effectual treatment.

These cases are not common, but when seen are not easily forgotten. I recently saw a lady who had suffered thus for two years; uterine disease was present, and all was put down to that, whilst the urethra was ignored. She then went to a stone specialist, who dilated the urethra and explored the bladder. A general surgeon then thoroughly explored both the rectum and the bladder, but still forgot the urethra. I was more lucky, and, proceeding as above advised, found the granular patches, scraped and cauterized them, and cured her at one sitting, and for the last six months she has had no return.

Vesico-Urethral Fissure.—This is another cause of excessive pain during and after micturition with severe tenesmus. The pain most resembles that in acute cystitis, except that in the latter the pain is decreased after micturition, instead of being increased as in fissure. The pain caused by this fissure at the neck of the bladder may well be compared with that due to a fissure of the anus.

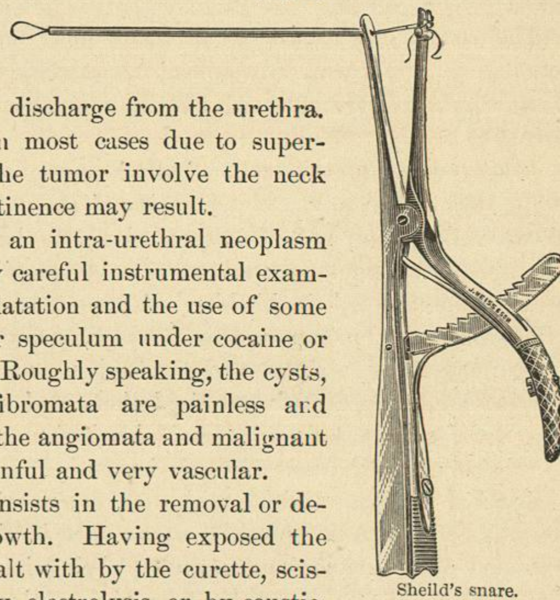
The diagnosis can be pretty accurately made by the effect of passing a hollow bulbous catheter, which is found to cause acute pain just at its entrance into the bladder, known by its bulbous end suddenly escaping into the bladder through the sphincter, and by urine beginning to pass through the catheter. Attempts have often been made to see

the fissure, but this is difficult even with an endoscope. Incising an unseen fissure is also unsatisfactory. Fortunately, however, a cure is almost always produced by dilating the urethra and the neck of the bladder by bougies, up to No. 18 English, unless it is desired to pass the little finger up to the bladder for further diagnostic purposes, when No. 24 is needed. Dilatation beyond this may produce subsequent incontinence.

New Growths.—These are of various kinds,—condylomata, cysts, adenomata, polypi (mucous or angiomatous), fibromata, sarcomata, epitheliomata, etc.

The symptoms are mainly pain during the act of micturition, and a frequent desire to micturate, yet often a dread of doing so resulting in postponing the act. Occasionally there will be slight hemorrhage at the end of micturition, especially if the neoplasm be vascular and near the neck of the bladder. If the tumors be relatively large, some obstruction may take place, and if ulceration occur there will be a constant pinky purulent discharge from the urethra. The obstruction is in most cases due to superadded spasm. If the tumor involve the neck of the bladder incontinence may result.

Fig. 1.



Sheild's snare.

The *diagnosis* of an intra-urethral neoplasm can be made only by careful instrumental examination, including dilatation and the use of some form of endoscope or speculum under cocaine or general anæsthesia. Roughly speaking, the cysts, condylomata, and fibromata are painless and non-vascular, whilst the angiomata and malignant growths are very painful and very vascular.

The treatment consists in the removal or destruction of the growth. Having exposed the growth, it can be dealt with by the curette, scissors, galvanic cautery, electrolysis, or by caustic, bromine, nitric or chromic acid, or acid nitrate of mercury. Some form of Simon's or Reeves's or Bryant's speculum exposes the growth well after its position has been localized by the test-tube or other endoscope, and at the same time protects the rest of the urethra from injury.

If the growth be pedunculated, one of the wire nooses used in ear-surgery, such as Marmaduke Sheild's snare (see Fig. 1) is extremely useful, or a small ear-curette may be sufficient. In either case some caustic should be subsequently applied. After removal a microscopical examination should in all cases be made. Primary or secondary hemorrhage is easily controlled by plugging the vagina.

Vascular Caruncle of the Meatus Urethræ.—[Some account of this common and important neoplasm was given, but, as the subject has been recently so ably and exhaustively treated in these pages by Dr. Herman, the remarks are here omitted.]

Prolapsus Urethræ.—This is a protrusion of the mucous membrane from the external meatus, and is usually secondary to intra-urethral neoplasm, chronic urethritis, or urethral displacement, such as occurs in cystocele and procidentia uteri. The protrusion may be circular, with the orifice in the centre, or limited to one side, with the orifice often then overlapped. The protruded part becomes congested, and often ulcerated and inflamed, and very sensitive. It has to be distinguished mainly from urethral caruncle and the bulging of the orifices of Skene's ducts.

The treatment is to remove the cause and replace the protruded membrane, using astringent applications afterwards. If this fail, the protruded part should be cut off and the edge of the mucous membrane sutured to the edge of the meatus.

Dilatation ; Diverticulum ; Dislocation.—This is an important group, each member of which is readily mistaken for another, all having many symptoms in common. As, however, the treatment of each essentially differs from that of the others, a correct diagnosis is most important.

Dilatation.—There may be dilatation of the whole urethra, or of any portion of it. Dilatation of the whole urethra is very rare, though cases are recorded where coitus has taken place in the urethra owing to absence or atresia of the vagina. The only two cases which have come under my notice were as follows:

Case I.—The first was in a girl whose spinal cord had been injured, resulting in paraplegia with paralysis of the bladder. A very large calculus, shown afterwards at the Obstetrical Society of London, became impacted in the urethra and was eventually drawn forward. Here dilatation and incontinence persisted for some weeks. Ordinarily, when the urethra is dilated to admit the little finger, the dilatation is recovered from almost completely in a few hours, though atony of the circular fibres at the neck of the bladder may remain and cause some amount of incontinence for two or three days.

Case II.—The second case was in a young girl with aggravated

hysteria, who closely simulated renal colic and passage of renal calculi by passing daily into her own bladder by means of scissors (!) small pebbles from garden gravel. She was able thus to imitate admirably, and for a time successfully, the colic, the sickness, the hæmaturia, and subsequently the clicking expulsion of the stone into the china utensil. She was also an inveterate masturbator. Her urethra easily admitted the little finger up to the neck of the bladder, and was much congested and full of large veins and petechiæ.

The anterior third of the urethra may be dilated as a result of external manipulation, or by the presence of foreign bodies or new growths. It may be accompanied by eversion of the edges of its orifice, secondary to chronically inflamed Skene's ducts, or to very chronic procidentia uteri with dislocation of the urethra and bladder.

The posterior third is not often dilated unless there is marked cystocele, or when the functions of the sphincter vesicæ are destroyed by central disease, or by local mechanical distention, such as results from the passage and impaction of a renal calculus. Dilatation of the middle third is much the most common form, and is generally called—or, I should say, *mis*called—*urethrocele.* It would be far better to reserve the term for a dislocation downward of the urethra, just as cystocele is the term given to dislocation downward of the bladder.

Urethrocele (Fig. 4), to use the ordinary nomenclature, is dilatation of the posterior or inferior wall of the urethra in its middle third, the anterior or superior urethral wall remaining in its normal position.

This dilatation is due mainly to an organic or a congestive narrowing of the anterior portion of the urethra, the result of urethral or peri-urethral inflammation. The floor of the urethra, being loosely supported, yields easily, and its mucous membrane becomes hypertrophied and redundant. More rarely urethrocele is due to injury (bruising and stretching) during the passage of a child's head, or to the prolonged pressure of a badly-fitting vaginal pessary, or to careless catheterism or dilatation, and also to a puckering of the anterior vaginal wall in cases of prolapsus uteri or retroversion with prolapse.

The symptoms of dilatation vary somewhat according to the part dilated. When the anterior third is dilated there are no symptoms apart from those of the cause of that condition. When the upper third is dilated there is always some amount of incontinence, especially in coughing, sneezing, laughing, etc., or even in the erect position.

In urethrocele there is frequent micturition, with a constant feeling that the bladder is not empty. If the urethrocele be large, it may contain nearly a drachm of urine, which speedily decomposes, owing to the

presence of a chronic catarrh, and much irritation and tenesmus result. Patients often find relief from this by passing the finger into the vagina and, by pressure, emptying the urethrocele of its contents after each act of micturition.

The diagnosis of urethrocele has to be made from dislocation of the urethra, dislocation with urethrocele, and diverticulum. The differential points will be noticed further on.

Anterior dilatation becomes obvious when a large sound passes easily at first and is arrested higher up. In *dilatation of the upper third,* urine flows from an introduced catheter before the real neck of the bladder is reached, and the end of the catheter can be felt per vaginam not to be grasped by the urethra at its dilated portion.

Treatment.—Much may be done to remedy minor degrees of dilatation by removing the cause and by astringent applications, as referred to under urethritis. If there be much congestion, local or general depletives are indicated, and vaginal tamponnings to afford rest to the urethra may be occasionally advisable.

If the mucous membrane be redundant it may be scarred with a fine-pointed galvanic cautery, after the urethra anterior to the part affected has been dilated. Emmet has practised an operation which goes by his name, which is especially useful in urethrocele, where the lining mucous membrane is always thickened and redundant. He makes an incision into the bulging portion by a pair of button-hole scissors, the probe-pointed blade being introduced into the urethra, the other blade into the vagina. The redundant portions of the mucous membrane are then drawn through the vaginal wound. If drainage is indicated, the edges of the urethral mucous membrane are stitched to the vaginal edges. If not, the mucous membrane rapidly recovers its healthy appearance and the vaginal wound closes. Where applications per urethram and vaginal support fail to cure, Emmet's operation should certainly be tried.

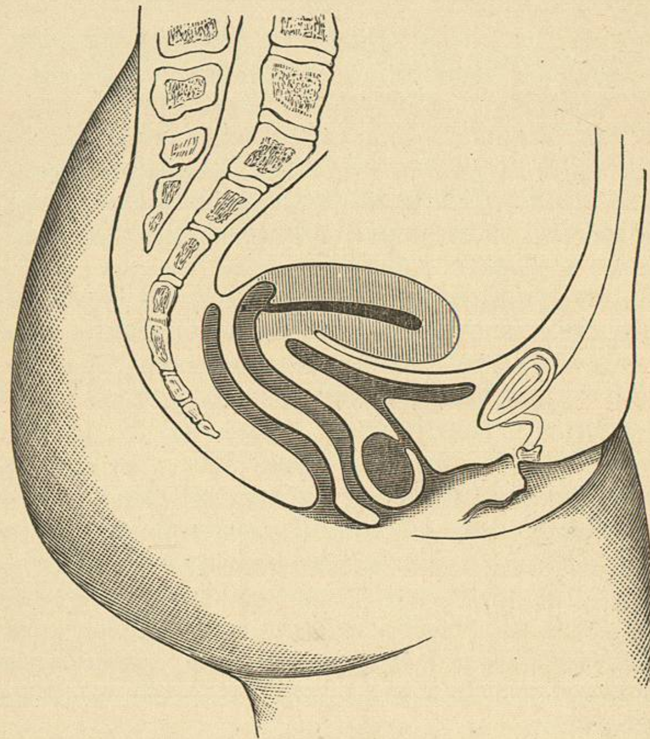
Diverticulum.—Urethral retention-cysts opening into the urethra are by no means rare.

A reference to the diagrams (Figs. 2 and 6) will show that a urethral diverticulum is essentially a urinary pouch or cyst occupying the urethro-vaginal septum communicating with a urethra of normal calibre, usually in the middle third of its floor, by an orifice relatively narrow.

Roughly speaking, the symptoms are progressive discomfort and frequency of micturition, the appearance and growth of a tender lump projecting at the vaginal orifice, the passage of thin irritating pus either at the end of micturition or on pressure, and sooner or later cystitis, etc.

The physical signs are as follows. Per vaginam, a rounded, tender, tense swelling is found in the urethro-vaginal septum opposite the middle third of the urethra. Its smoothness and elastic hardness are characteristic, the rugæ of the mucous membrane over it being obliterated. In some cases the mucous membrane moves freely over the underlying sac, in others it is adherent by inflammation. A sound

Fig. 2.



Urethral diverticulum.

passed along the anterior wall of the urethra goes directly into the bladder, proving that the case is not one of urethral dislocation.

As proving further that these cases are not simple dilatations of the middle third of the inferior wall of the urethra (simple urethrocele), it is found that a large-sized sound will not enter the pouch, but will pass on into the bladder, whereas a small sound or probe will find its way through the narrow opening (which is often valvular) if it be passed along the posterior wall of the urethra. The exact size of the

opening (usually from No. 4 to No. 8 English catheter) is ascertained by a graduated bulbous sound.

With a bougie lying in the urethra the sac is felt to be quite distinct, and even when emptied by pressure it remains a distinct, thick-walled cyst. When full these cysts vary in size from that of a pea to that of a hen's egg.

After being emptied, it only partially refills at the next act of micturition, taking six or eight hours to become tense by exudation from its own lining membrane.

As regards its etiology, I have mentioned numerous ducts and glands which are in connection with the urethra. Any of these ducts or glands may become retention-cysts by closure of their orifices from urethritis, peri-urethritis, or even accidental plugging. As a result of suppuration or rupture, the cyst then opens again into the urethra, and the inflammation is kept up by urine finding access to its cavity at each act of micturition, and, owing to the small and often valvular character of the opening, the distention of the cavity increases. As these diverticula appear to be always opposite the middle third of the urethra, it seems improbable that they can be due to occlusion and distention of Skene's ducts, which are opposite the anterior third, unless Skene's ducts are the anterior termination of Gartner's ducts, which are certainly responsible for many vaginal cysts nearer the cervix uteri. Max Schuller's glands, from which Skene's ducts are usually supposed to lead, seem, however, to be the most likely origin of these retention-cysts.

Pregnancy, with its greater local activity, seems to be a starting-point of their formation, and the impending labor causes them to rupture into the urethra, in that case anticipating the slower effects of a subsequent suppuration if only inflammation ensued.

The treatment varies. If the cysts do not communicate with the urethra they may be dissected out, or merely incised and drained per vaginam, but when urine is obtaining intermittent entrance the following seems the best treatment:

1st. Where urethritis or cystitis already exists, the cyst-wall should be dissected out, and the vaginal wound left wholly or partly unclosed to allow of free drainage.

2d. Where the urine is normal and the urinary passages are healthy, the cyst should be dissected out, the opening into the urethra enlarged to allow of urethral drainage, and the vaginal wound at once closed with wire sutures, which should not enter the urethra itself.

Until union is complete, the vagina should be kept aseptic and the

urine should be drawn off either at regular intervals or by a self-retaining catheter.

In dissecting out the diverticulum the presence of a large bougie in the urethra is helpful, and the contents of the cyst should not be pressed out, lest it become flaccid.

Dislocation of the urethra requires but little explanation after what has been already said.

The four diagrams (Figs. 3 to 6) may further aid the diagnosis. Dislocation of the urethra is often present in procidentia uteri and

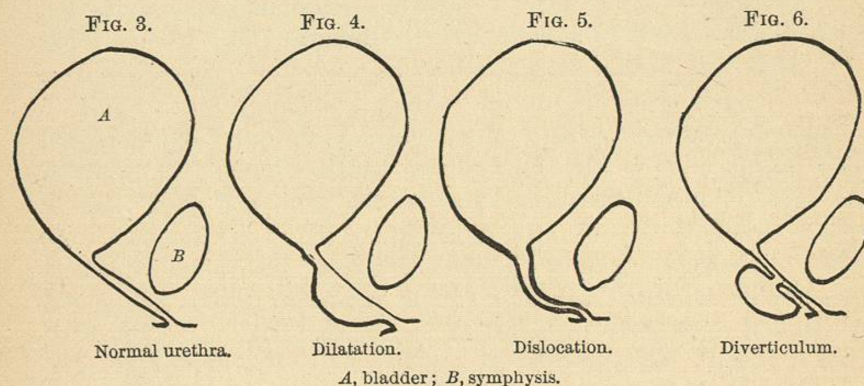


FIG. 3. Normal urethra. FIG. 4. Dilatation. FIG. 5. Dislocation. FIG. 6. Diverticulum.

A, bladder; *B*, symphysis.

cystocele, the sound going at once downward and forward into the bladder lying on the protruded uterus, covered by the inverted vaginal wall. Sometimes, however, cystocele occurs whilst the urethra remains normally situated. The urethra, again, may be dislocated or drawn upward in cases where the bladder is displaced upward by adhesions to the front or back of a growing ovarian cystoma, and in cases of retroversion of the gravid uterus. In such cases the urethral orifice is drawn up with the anterior vaginal wall and is absent from the base of the vestibule, and may be seen only by using a Sims speculum.

In partial cystocele the upper end of the urethra is dislocated, the vesical end then lying at a lower level than the meatus externus. When the whole urethra is dislocated, apart from cystocele, there has usually been a difficult labor as a cause, the advancing head dragging the anterior vaginal wall and urethra away from its attachments. This condition is very apt to persist if the perineum is torn, the anterior vaginal wall being thus deprived of its posterior support.

The symptoms do not differ much from those of dilatation. The treatment consists in supporting the anterior vaginal wall and keeping the uterus at a proper level by a suitable pessary, or by tamponning

the vagina, and, if necessary, by restoring the integrity of the perineum by surgical means.

Lack of space allows me to say only a few words on *stricture*, which, as compared with stricture in the male urethra, is less frequent and important. It is mostly produced by peri-urethral inflammation, or by cicatrices the result of injury, or following operations by caustics or the cautery.

Frequency of, and slowness and difficulty in, the act of micturition are the main symptoms, with retention by superadded spasm or congestion.

The diagnosis needs only a series of bulbous-ended sounds to make the exact position and extent obvious.

The treatment consists in dilatation by bougies, followed by the use of a retention-catheter, such as Goodell's, and, if need be, the division of any cicatricial bands by some form of urethrotome. Atrophic contraction, such as is seen in long-standing vesico-vaginal fistula, requires patient and gradual dilatation to allow the tissues to become accustomed to the changed conditions after the cure of the fistula.

If these imperfect remarks should lead those present to study with more thoroughness urethral conditions in the female, much good may ensue, for from considerable experience in gynæcology I am constantly meeting with cases of urethral diseases the existence of which has been absolutely ignored by men whose experience in female pelvic diseases is far greater than my own.

It almost seems that if, on inspection, no gross lesion, such as vascular caruncle, is discovered, it is at once assumed that the urethra must be healthy, and that the cause of the dysuria, etc., must be looked for in the condition of the other pelvic organs. That common urethral diseases should not be thus overlooked is the object of this rather hurried sketch of the subject.