tions in the eye-tissues that induce glaucoma is still an enigma.

The circulatory conditions in the eye resemble those in the intracranial cavity, with the exception that the intra-ocular pressure is much higher than the intra-cranial pressure, and, therefore, is not affected by changes in the general venous pressure.

REFERENCES.

BOLTON, C. An Experimental Study of the Pathology of Cardiac Dropsy and its Relation to that of Venous Obstruction. *Journ. of Pathol. and Bacteriol.* Vol. XIV. 1910.

BECHHOLD, H. Die Kolloide in Biologie u. Medizin. Dresden. 1912.

FISCHER, MARTIN. Das Ödem. Dresden. 1910. Nephritis. 1912.

KREHL und MARCHAND. Handbuch der allgem. Pathol. Leipzig. 1912.

LAZARUS-BARLOW. General Pathology. 2nd Edit. 1904.

OSTWALD, WILHELM. Grundriss der allgemeinen Chemie. 1909.

STARLING, E. The Fluids of the Body. 1909.

ART. XIX.—*Gynæcological Urology*.^a By M. J. GIBSON, M.D.; Master of the Coombe Hospital; Gynæcologist to the Richmond Hospital, Dublin; President of the Obstetrical Section of the Royal Academy of Medicine in Ireland.

I HAVE to thank you sincerely for the honour you have paid the Coombe Hospital and me. In seeking a subject for this address which would relate to both obstetrics and gynæcology, I decided on a review of some of the urological subjects with which we are constantly brought in contact. It is apparent that much of the work done in urology by the members of this Section is not reported. One explanation may be that there is still some doubt as to whether the gynæcologist, in dealing with such work, is going outside

^a Read before the Section of Obstetrics in the Royal Academy of Medicine in Ireland on Friday, November 7, 1913.

his own province. There are, however, many conditions of the urinary system which demand our attention and our treatment. Some of those of which I have had experience I wish to review in the hope that further information may be obtained from the experience of the members of this Section.

Bladder troubles are present in the histories of our patients to nearly as great an extent as menstrual troubles, back-ache, and inter-menstrual discharge. One recognises that in many cases these troubles are regarded as being associated with the different affections of the genital tract, and that the cure of the genital trouble will be followed by the disappearance of the urinary symptoms. In some cases this conclusion is correct, in others it is false. It was the fashion as long as the urine contained neither blood nor pus to treat such cases gynaecologically. They must, however, be considered as due to affections of the urinary system until a complete examination has proved otherwise.

I do not propose to consider in detail the modern developments in cystoscopic work which have made it possible for us to attain more exact knowledge of these conditions. They have, however, served to show still more convincingly the intimate connection existing between gynaecology and many diseases of the urinary tract.

Among the interesting conditions of the bladder with which we have to deal are those arising in connection with pregnancy. In general the condition of the bladder during pregnancy, owing to its congestion and oedema and stretching of its walls, predisposes it to infection. The pressure of the pregnant uterus or of the head of the child can make spontaneous evacuation of urine difficult, and bring about incomplete emptying of the bladder. In some cases, owing to straining, small quantities of urine are expelled frequently, pointing to a relative incompetence of the sphincter control. In this way micro-organisms readily effect their entrance. In cases of neglected retroversion of the gravid uterus at the end of the third month, the pressure of the cervix in conjunction with the congestion and stretching of

the region of the internal sphincter leads to retention, which is followed by incontinence. Unless proper treatment is provided infection occurs, which, with the over-distension, may lead to more or less extensive destruction of the bladder wall. In fatal cases death is nearly always due to complications involving the urinary tract. Extensive pyelonephritis, peritonitis from rupture of the bladder, septicæmia or pyæmia are present. Puerperal cystitis is further predisposed to by the trauma to which the bladder is subjected during labour, and, in addition, we have the infected state of the urethra and its neighbourhood soon after labour.

Our observations in cases where catheterisation was required at this time showed how readily the urine could be rendered purulent. But in these cases the ordinary symptoms of acute cystitis are often absent. The origin of many cases of bladder trouble may thus be traced to infection during pregnancy or the puerperium.

In post-operative cystitis, according to Baisch, the primary infection is staphylococcal, sometimes streptococcal. Super-imposed, may be a *Bacillus coli* infection, if it be not already present before operation. Regarding the prevention during operation, efforts should be made to prevent infection of the connective tissue about the bladder, and careful technique in closing the peritoneum over the bladder should be employed. When the catheter must be used, the bladder should be douched with a 2 to 5 per cent. solution of boric acid. This, with urinary antiseptics, is likely to be successful in mild cases where the bladder has not been much disturbed. But after the radical operation for cancer of the cervix, cystitis is almost invariable in spite of these precautions. Douching should be employed here for what it is worth to keep the cystitis in control. Five to ten cubic centimetres of a 1 per cent. solution of collargol injected into the empty bladder and afterwards washed out has been recommended for these cases.

The symptoms vary in degree. The insensitiveness of

the bladder during the first week, particularly after a cancer operation, is very marked. Many patients have an over-distended bladder without knowing it, and only partially empty it when passing water. When this is overlooked the cystitis does not heal, and patients should not be allowed to leave hospital until they are capable of completely emptying the bladder.

In dealing with inflammation of the bladder, we frequently see the cystitis colli in which the inflammatory changes are localised to the trigone. This may be a result of a more diffused cystitis which has become chronic, or of gonorrhœal extension (the cystitis colli gonorrhœica), or extension from a urethritis due to some other cause, or as a result of tying in a catheter.

In cases of cystitis colli gonorrhœica one frequently finds numbers of polypi of various sizes growing from the mucous membrane around the edge of the sphincter. These may become impacted in the sphincter and cause obstruction.

In treating cystitis colli the only satisfactory method is the direct application of nitrate of silver, protargol, &c., on wool through the urethroscope tube. Attempts to cure this condition by douching are fruitless; in fact they usually aggravate it. The condition is recognised with the cystoscope.

The cystitis in old women is mainly due to an ascending infection. The shrinking vaginal wall pulls the outer lips of the urethra apart. The elasticity and capacity of the bladder are reduced. The micro-organisms, and particularly the colon bacillus, ascend to the bladder along the continuously urine-bathed urethra.

Other conditions are paracystitis, which may cause a localised cystitis, pericystitis with adhesion formation between the serous coat of the bladder, the omentum, the appendix or the intestine, which may prevent complete evacuation.

Cystocele, predisposing as it does to retention of urine and cystitis, should always be corrected as early as pos-

sible. The rupture into the bladder of a parametric abscess is followed as a rule by healing, but when the rupture is from a pyosalpinx or ovarian abscess, healing occurs only when the tube or ovary is removed.

Stone in the bladder is rare, but foreign bodies resulting from operation, criminal abortion, masturbation, &c., are fairly common.

Vesico-vaginal fistulæ after labour or after operation are due to necrosis of the bladder wall or insufficient repair of a wound. After suturing a wound the bladder should be distended with fluid to test it. For the accurate localisation of such a fistula, and particularly its relation to the ureters, cystoscopic examination, having previously plugged the vagina, is most valuable. In extensive cases the distension of the bladder with air must be employed.

Urethrocele, the sac formed in the posterior third of the urethra, due to injury to the muscle during labour, leads to retention of a small quantity of urine in the sac. Some of this urine is expelled every time the patient strains or coughs, and is in this way a cause of very troublesome incontinence.

Urethritis is generally secondary to cystitis or to traumata or to gonorrhœal infection. Gonorrhœal urethritis does not tend to extend to the bladder. One should, therefore, avoid any local treatment of it, especially in the early stages. It soon becomes chronic, and invades Skene's ducts. It may be localised or diffused, which condition, if present, can be settled only by the urethroscope. We sometimes find the wall of the urethra uniformly thickened. Stricture, though rare, is sometimes present. Stricture may also be due to tuberculosis, syphilis, or injury during labour.

In many cases a pyelitis demands our care. It must be regarded to a considerable extent as a clinical entity—a clinical condition embracing those causes of infection of the renal pelvis where evidence of involvement of the parenchyma is wanting. Only exceptionally do patients die as a result of a simple pyelitis. There must, naturally, there-

fore, be considerable difficulty in deciding in any given case of pyelitis as to whether the parenchyma is also involved, and, if so, to what extent. *Post-mortem* examinations, owing to the low mortality of cases regarded clinically as pyelitis, have helped to throw very little light on this matter. There are, however, quite a large number of cases recorded, where, on splitting the kidney at operation during life, the inflammation appeared macroscopically to be limited to the renal pelvis. Of the microscopic condition of the parenchyma there is no mention.

Acute pyelitis may be sero-fibrinous, diphtheritic, purulent or gangrenous. Chronic is described as proliferating, granular or cystic. In but few cases is the cause other than an infective process. The *Bacillus coli*, typhoid and paratyphoid bacillus, influenza bacillus, the *Bacillus pyocyaneus*, the *Bacillus proteus*, the gonococcus, strepto- and staphylococci, and the pneumococcus, have all been shown to be capable of causing infection of the renal parts. In the vast majority of cases the offending micro-organism is the *Bacillus coli*.

We know that the introduction of microbes into the healthy bladder will not cause cystitis. The intravenous injection of *Bacillus coli* will not cause pyelitis. Micro-organisms can pass over the mucous membrane of the renal pelvis without causing pyelitis. Cases are recorded where pyelitis is present on one side and bacteriuria without pyelitis on the other.

Among the predisposing factors which allow of the invasion of the tissues of the renal pelvis are the congestion and œdema of the tissues during pregnancy and the puerperium, lowered vitality induced by traumatism or old-standing inflammatory conditions, obstruction to the passage of urine from the renal pelvis to the ureter or from the ureter to the bladder. The patient's powers of resistance will naturally also play an important part.

The infection may be ascending or descending. In favour of ascending infection are the sudden appearance of the symptoms of pyelitis in patients known to have

cystitis, the presence in the ureter above a site of compression, of urine which is clearer than that below. Infection reaching the renal pelvis through the lymphatics is observed in pyelitis secondary to a septic focus in the pelvis. Such a mode of infection is observed in the localised inflammation of the bladder wall corresponding to a unilateral parametritis. Again, if the micro-organisms in the bladder invade the tissues about the openings of the ureters they may make their way to the wall of the ureter, and eventually reach the renal pelvis, travelling in the lymphatic spaces. Probably the most frequent form of ascending infection is that through the lumen. Normally, this is prevented by the very complete closure of the ureteral orifices when no passage of urine into the bladder is taking place, and the jet-like manner in which the urine is expelled. It has been shown that the movements of the ureter present definite stages comparable to intestinal peristalsis. They are dependent on the integrity of the musculature. The sphincter mechanism of the orifices may be overcome by forcible contractions of the full bladder, accompanied by spasm of the sphincter urethræ. Again, injury to, distortion or rigidity of, the edges of the orifices may lead to incompetence. Regurgitation from the bladder may thus occur with the danger of ascending infection should the bladder contents be septic. These facts explain why the results of implantation of the ureters still attached to the trigonal region are more satisfactory than when the cut ends alone are available.

The ejaculation from the ureter is interfered with by the existence of some unusual resisting force or by a lesion involving the muscular layer. Among these conditions we find tumours pressing against, or growing in the wall of the urethra; stricture, stone or foreign body impacted in the urethra, paralysis of the bladder, over-stretching of the bladder during pregnancy, tumours of the bladder situated in front of the orifices of the ureters, stricture or stone in the ureter, ureterocele, compression of the ureter from a tumour or the uterus, contractions of the tissue surround-

ing the ureter from processes such as parametritis and appendicitis, an abnormal angle of junction at the pelvis of the kidney whether due to floating kidney or other cause, calculus, tumour, or spurs in the renal pelvis. The overstretching of the renal pelvis alone or with the ureter, injures the functioning power of the musculature. Wertheim has shown that after operations for cancer of the cervix urine may be locked up in the renal pelvis even though no injury has been inflicted on the ureter in the surgical sense. Its extensive detachment from its tunica adventitia leads to loss of the peristalsis. That there is no obstruction in many cases has been proved by the sound.

Anatomically we know that there is some degree of narrowing, firstly, where ureter and renal pelvis meet, secondly, at the pelvic brim, and thirdly, where the ureter traverses the bladder wall. That the intrapelvic course of the right ureter to the bladder is not as direct as that of the left is given as one of the causes of the greater frequency of right-side pyelitis. During pregnancy the usual position of the uterus favours pressure on the right ureter more frequently. It has been shown in cases of chronic ureteritis, in which degenerative processes following on inflammation resulted in failure of the motor mechanism of the ureter, that, although the lumen of the ureter was actually somewhat dilated, the pelvis of the kidney could not empty itself satisfactorily and had become enlarged. As to whether an acute ureteritis can cause obstruction, one cannot definitely say, but there is no doubt that one finds a very sluggish action of the ureter in cases of inflammation of the tissues surrounding the ureteral orifices.

Whether, in cases of obstruction, the pent up urine becomes infected, or whether in the majority of cases the urine from the kidney is already infected, is naturally difficult to determine. But that the latter is the more probable is borne out by the known frequency with which bacteria are found to exist in the female urinary tract.

Descending infection may be due to a septic focus near the renal pelvis or infection of the renal pelvis through its

lymphatic vessels or hæmatogenously. The hæmatogenous is the most frequent of these modes of infection. It may be due to a septic focus, such as the uterus, a joint, &c., and it is the invariable path in tubercular pyelitis. The intimate relationship between the lymphatics of the colon and renal pelvis on the right side explains pyelitis following inflammatory conditions of the colon. The healthy intestinal wall efficiently prevents the passage of bacteria from its lumen. This property can be maintained in spite of considerable interference with the circulation through its blood-vessels. In cases of strangulated hernia the fluid in the hernial sac is sterile unless the bowel has become gangrenous. But accumulation of large quantities of hardened fæces renders the wall pervious to the colon bacillus, probably by causing superficial ulceration with resulting infection of neighbouring viscera. Pyelitis may be caused by advanced constipation, whether the infection spreads through tissues poisoned by an ulcerated process or through the lymphatic channels.

Pyelitis complicating acute or chronic gonorrhœa is rare. This is probably due to the fact that gonorrhœal urethritis does not usually extend to the bladder. While in the male, infection from the blood may occur, in the female gonorrhœal pyelitis is practically always an ascending infection. The trigone being most affected, the ureteral orifices may be deformed.

Chronic pyelitis may be present without any subjective symptoms. The urine is cloudy, but since pyelitis is so often associated with cystitis, this fact loses much of its value as a point in differential diagnosis. When the condition is acute the onset is marked by such features as fever, rigors, severe pain in the back and front of the lumbar region on affected side, sometimes radiating towards the bladder, rapid pulse. Cases without fever, or in which at the onset the temperature gradually increases, are the exception. The fever is usually remittent. Symptoms due to the toxæmia may be present, vomiting, diarrhœa, neuritis, mental disturbances, &c. In

a number of cases the symptoms of cystitis are most prominent. As regards the urine, the quantity is at first diminished, then markedly increased. The pale, yellow, watery colour is characteristic in the later stages. The reaction depends on the bacteria present. Only in cases where, in association with a small amount of pus, a large amount of albumen is present, is one justified in diagnosing involvement of the renal parenchyma, and in such cases tube casts are usually present. In none of our cases has there been much blood in the urine. It is only likely to be present in quantity in cases of pyelitis complicating chronic renal disease. The pain is chiefly due to the inflammation and distension of the renal pelvis. Stretching of the kidney capsule due to swelling of the kidney may account for some of the pain. The radiation of the colicky lumbar pain to the bladder is to be explained by the contractions caused in the effort to overcome the distension of the renal pelvis. Such contractions pass along the ureter to the trigone. In acute cases it is sometimes possible to demonstrate in the blood the presence of the bacteria causing the pyelitis.

The diagnosis is established by the cystoscope and catheterisation of the ureters, but in cases with characteristic symptoms it is often possible to dispense with their aid. With the cystoscope, in cases where there is much pus, the stream of turbid urine may be observed. One can also note whether the volume on the diseased side seems less than on the healthy side, and whether the intervals during which no urine escapes are longer. Catheterisation of the ureters gives accurate information as to the site of an obstruction and the existence of urine pent up in the renal pelvis. For example, Stoeckel has shown that in cases of pregnancy pyelitis the usual site of obstruction is about thirteen cms. above the opening of the ureter at a point corresponding to the level at which the ureter crosses the pelvic brim. In a few cases the obstruction in the ureter was rendered passable by pulling the uterus forward and to the opposite side. Urine pent up escapes from the

catheter in a continuous stream or in very rapidly succeeding drops which can often be converted into a continuous stream by compression of the kidney. In cases of renal pelvis obstruction the functional activity of the kidney is usually decreased, but recovers when the obstruction is overcome. The extent of the involvement of the kidney parenchyma is consequently a matter of uncertainty. But when a pyelitis fails to get well in spite of treatment the probability of pyelonephritis should not be overlooked.

Pyelitis may be simulated by any of the acute inflammatory processes, such as appendicitis, pyosalpinx, subphrenic abscess, pneumonia, gall-bladder trouble, twisted ovarian cyst, &c. I have also seen it mistaken for puerperal sepsis.

An acute pregnancy pyelitis can very much resemble pneumonia, as in one of my cases; against it are the pulse and respirations, which are less frequent than in pneumonia, and the absence of sputum. The patient frequently will complain that the pain extends to the lower abdomen, and although it is aggravated by the respirations, it is more so by movement. The more commonly intermittent temperature and the tenderness of the kidney are to be noted. In the diagnosis from appendicitis the tenderness over the ureter about M'Burney's point is not accompanied by the same rigidity as acute appendicitis. Difficulty in diagnosis should exist only when one of these conditions complicates pyelitis.

Before leaving this I would again point out that bladder symptoms are not always present. This is so in many cases of descending infection, and we also know that cystitis need not be present when the urine is purulent and contains *Bacillus coli*. Therefore, in cases of fever during pregnancy or puerperium, even when there are no bladder symptoms, the urine must be microscopically and, when possible, bacteriologically examined.

As regards the outlook, here, as elsewhere, one finds that most strains of staphylococci and streptococci may invade the living tissues under favourable conditions. This is only

exceptionally so with the *Bacillus coli*. But one must recognise that the virulence of different strains of strepto- and staphylococci varies considerably. Prolonged retention of purulent urine in the renal pelvis leads to poisoning of the cells of the kidney parenchyma. Their resistance may diminish to such an extent that even the *Bacillus coli* is enabled to gain a footing and cause a suppurative pyelonephritis. The outlook in pyelitis is most favourable from a life point of view where the infecting micro-organism is the *Bacillus coli*. The outlook is much graver when the infection is strepto- or staphylococcal. The *Bacillus coli* particularly tends to persist, and even years after an acute attack of pyelitis other attacks can follow and lead to pyonephritis. Pregnancy pyelitis usually subsides after delivery, and only rarely appears during the puerperium. Opitz, amongst 53 cases, found that in only 20 did the pregnancy pursue a normal course, 23 came into labour prematurely, and 10 had labour induced.

In managing pyelitis in general as it affects the female one should adopt an expectant line of treatment unless urgent symptoms have developed. Rest, light diet, antiseptics, particularly salol and urotropin, alkaline or acid fluids, according to the reaction of the urine and the particular micro-organisms which it contains while still within the urinary tract. The administration of large quantities of fluids seems undesirable in cases of obstruction, as it may lead to further embarrassment of the renal pelvis. In pregnancy pyelitis one tries, in addition, the effect of making the patient lie on the healthy side. This in some cases may relieve the compressed ureter. Opinions differ concerning the value of vaccine treatment. The results of such general treatment are good. It particularly assists in tiding a case of pregnancy pyelitis to the time labour sets in. The pyelitis usually disappears spontaneously in the puerperium. Local treatment is indicated in acute cases of pyelitis by the patient's general condition, or the severity of the lumbar pain suggesting excessive distension of the renal pelvis. In

some acute cases it is indicated when conservative treatment has failed. Catheterisation of the ureter, with or without washing out of the renal pelvis by injecting 8 to 12 c.cms. of silver nitrate solution, one in a thousand, or a 5 per cent. solution of protargol, slowly along the catheter, yields good results. Its immediate escape is allowed. Prolonged drainage by means of a catheter reaching to the renal pelvis is advised in severe cases. It is said that the catheter may be left any time up to a week or longer, and be reintroduced if symptoms recur after its removal. This prolonged drainage has reduced the number of cases requiring the termination of pregnancy, or, as may sometimes be preferred, nephrotomy. We have found simple catheterisation of the ureter two or three times weekly, depending on the urgency of the symptoms, to be sufficient in cases of pregnancy pyelitis. In other cases of pyelitis, douching the renal pelvis with one in a thousand nitrate of silver has given good results. When conservative methods and local treatment have failed, and severe symptoms exist, we must recognise that we are not dealing with the pyelitis only, but also with infection of the kidney, and in such cases nephrotomy is indicated.

As regards ureteral fistulæ occurring spontaneously after the radical operation for cancer of the cervix, Wertheim had 6 per cent. in 400 cases, of which 52.4 per cent. healed spontaneously, yielding in every instance a functioning permeable ureter. Only once in a later series of 335 cases was spontaneous healing followed by cessation of kidney function due to complete obstruction. Weibel maintains that mere isolation of the ureter will not cause fistula. In the vast majority of Wertheim's cases it did not, and in many of his fistula cases isolation was not done, as they were very early. Franz isolates the ureter freely in all cases, and has only 5 per cent. of fistulæ. Subperitoneal sepsis may help to cause fistulæ, but Weibel states that no such sepsis was evident in many of Wertheim's cases of fistulæ. Placing sutures too close to the ureter, and in this way dragging and interfering with its blood-supply, and

with the passage of urine, is recognised by Weibel as a cause of fistulæ. Weibel also maintains that the assistant is often responsible in early cases—in holding the ureter aside, he injures it. Bumm, Stoeckel and Franz maintain that gauze drainage of the pelvis predisposes to the occurrence of fistula. Wertheim always uses gauze drainage, and has only 6 per cent. of fistulæ. In Wertheim's second series of 335 cases the percentage of spontaneous fistulæ was again 6 per cent., but of these only 36.8 per cent. healed spontaneously. Of those which do not heal spontaneously, many die from pyelitis. For double-sided cases the outlook is bad. For example, in the cases occurring spontaneously among Wertheim's cases, two healed on both sides with restoration of function, five persisted on both sides, and death occurred in two from recurrence, and in three from pyelitis. A study of Wertheim's results shows that narrowing of the ureter with obstruction can take place with or without symptoms after both easy and difficult operations in cases where the parametrium was or was not carcinomatous, where the ureter had or had not been extensively isolated, immediately or not for months, or even years, after operation, and that pyelitis may follow.

In treating these cases one must remember that spontaneous healing may occur even after the lapse of several months. During the period of waiting, the danger of ascending pyelitis is always present, and, consequently, Stoeckel advises implantation or nephrectomy after six weeks. Wertheim waits for three months, and prefers nephrectomy to implantation, as it is safer and simpler. In cases of double-sided fistulæ Wertheim waits as long as possible without allowing pyelitis to set in, and implants both ureters in the bladder.

In cases where the ureter was injured unintentionally during operation, Wertheim adopted suturing in four cases; two healed, one developed fistula and pyelitis, and the fourth a simple fistula. When the division was complete, implantation in the bladder was followed by good results.

Wertheim resected the ureter in only 1.5 per cent. of cases. In these 11 cases implantation was followed by good results in 10 cases, as far as healing was concerned. One tore out, but in this case there was undue tension. In one case successful implantation was not followed by recovery of function. In this case the kidney was found atrophied and the ureter closed. One of his cases shows that after months stenosis and severe pyelitis may ensue in an implanted ureter which had previously acted satisfactorily. Veit states that when a ureter needs resection the outlook is always most unfavourable. Wertheim agrees with this, and where possible avoids resection of the ureter, preferring to free it from the surrounding cancer, and thus his immediate results are better.

Cystoscopic examination in cases of ureter fistula shows that the ureter orifice is active without expelling urine when it is partially divided. It is not active when it is completely divided. In doubtful cases the catheter will settle the question. It is always arrested at the site of division or accidental ligature. One can also recognise soon after operation, before a fistula develops, whether one or both ureters have been tied. Again, after implantation in the bladder, there is no other way of deciding whether the ureter and its kidney are acting.

The usual cystoscopic examination which is carried out before deciding on operation in cases of cancer of the cervix will show the presence of bullous œdema and the cushion-like œdema of the mucous membrane very frequently. This indicates that either the cancer or the inflammatory process which precedes it has reached the outer wall of the bladder. It is not a contra-indication to operation.

Stone in the female ureter is frequently impacted owing to the three physiological narrowings, the possibility of obstruction from parametritis or paraureteritis, tumours of the adnexæ, &c. False diagnosis of appendix and adnexæ troubles has been made.

The recognition of displacements of the ureter due to

parametritis, myomata, carcinoma, over the surface or under the base of an intra-ligamentary tumour, often influences the success of operations.

In conclusion I would remind you that kidney tuberculosis in women is frequently overlooked; they come with gynæcological complaints, and often with scarcely any bladder symptoms, the urine is slightly turbid, and may or may not contain blood. Many of these cases remain unhealed, and in them early diagnosis of the kidney involved is essential. This can be established only by complete examination of the urine, the use of cystoscope, and animal inoculation.

In this review it was impossible to deal exhaustively with my own cases without adding too much to its length. I hope that gynæcological urology will provide material for more complete discussion at subsequent meetings.

REFERENCES.

- Baisch. Hegar's Beitr. 3.
Casper. Handb. d. Cystoskopie, 1905.
Franz. Zeitschr. f. gynäkol. Urologie Bd. 1.
Oppenheimer. Zeitschr. f. urologische Chirurgie Bd. 1.
Weibel. Zeitschr. f. gynäkol Urologie Bd. 4.
Stoeckel. Veits Handb. d. Gynäk. 2.
Rübsamen. Zeitschr. f. gynäkol Urologie Bd. 4.

ART. XX.—*Petrol as a Therapeutic Agent.* By G. ARBOUR STEPHENS, M.D., B.S., B.Sc.; Hon. Physician, Royal Cambrian Institute for the Deaf; Appointed Surgeon under the Factory Act; Hon. Med. Officer, Swansea Collieries Rescue Station.

It is hardly necessary to describe the well-known hydrocarbon which is in daily use as an important factor of our motor traffic.

Its clear appearance, its characteristic odour, and its ready volatility are well known, whilst its properties as a cleanser are held in high respect by every practical housewife.

But up to the present very little has been written on its