

PELVIC PERITONITIS & SOME OF
ITS SEQUELAE.

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The study of Pelvic Peritonitis can hardly be separated from that of pelvic inflammation generally - seeing that in almost every inflammation in the pelvis the peritoneum is involved to a greater or less extent, and as a matter of fact, the number of cases where it is involved primarily is comparatively small. The inflammatory process is essentially a protective one, and the symptoms which may arise later on, are, as a rule, due to the organization of the exudates thrown out by the peritoneum in its efforts to limit infection. These exudates give rise to so-called adhesions, which may therefore be defined as the evidence of a past-peritoneal reaction. Symptoms issuing from these may be very persistent and continue long after the original focus of inflammation has subsided.

In studying pelvic disease the number of cases in which there has been an infection of the peritoneum, as evidenced by the presence of adhesions is very great; their presence at times bulking in the symptomatology, at others being quite secondary and unimportant; the treatment of these adhesions at operation is, in one case, a matter not giving rise to any trouble, in another case, by interfering with the technique of the operation, by altering and obscuring the normal relations of structures, rendering the operation a difficult and often dangerous one, so it must necessarily be a subject ~~exte~~ présent in the mind of the operator. And this applies not only to the time of the operation, when their

direct treatment must be decided on, but also in the knowledge that by preventing their reformation we are preventing a source of future pain and discomfort, if not worse, to our patient.

We ~~As~~ must look on a pelvic peritonitis as the process by which the peritoneum reacts to injury, whether that injury be in the form of a bacterial infection - the commonest, or of a chemical irritation or trauma of any sort, and we must bear in mind that the reaction is of the nature of a protective process to the peritoneum primarily and secondly to the individual; being one of Nature's methods of combating infection

The normal peritoneum is transparent, and we can see through it the color of the underlying tissues. It is thicker over the rectum and the iliac vessels, where, as a rule, it is opaque, while it is very thin over the uterus and especially over the tubes. The stomata of the pelvic peritoneum are most marked at the junction of the posterior wall of the broad ligament and on the floor of the pouch of Douglas. These are of importance in reference to absorption by the peritoneum. The peritoneum is a large lymph sac lined with endothelial cells, and the stomata communicate directly with lymph spaces underneath. In this regard it is interesting to ask what is the function of the peritoneum? Is it merely a lubricating surface? Probably not.

In a patient with general adhesions there may be practically no peritoneum as such. The peritoneum readily absorbs fluid and it surrounds all the absorptive organs in the abdomen. The peritoneum too has a greater nerve and blood supply than is necessary were it merely for lubrication, and the same applies more particularly to the omentum. The peritoneum has a definite resisting power to infection. If definite quantities of pathogenic organisms be injected into the peritoneum of a guinea pig, they cause no trouble, but if the same organism be injected with the addition of a large quantity of water - too great to be readily absorbed - then septic peritonitis results. The fluid here prevents the peritoneum from destroying the organisms. The old view that the peritoneum is especially susceptible to infection has been disproved and we must regard the peritoneum as one of the most resistant tissues. In the most careful abdominal section it is almost impossible to definitely exclude the entrance of some micro-organisms, but the peritoneum is able to withstand and deal with a great number of micro-organisms. We know from physiological experiments as well as from observations at laparotomies how easily blood for instance is absorbed in the peritoneal cavity when the peritoneum is healthy. But if it has been injured by any inflammatory process, this power is impaired, and the blood acts as a foreign body and tends to set up a reaction of the peritoneum resulting in protective exudates.

In the case of a haematocele the blood may not give rise to any trouble except a suitable condition of the peritoneum is present. The most usual condition preventing absorption of blood is a previous inflammation of peritoneum. The two factors necessary in such a case to have resulting trouble are 1. Impairment of the absorptive power of the peritoneum in case the effusion is small. 2. Great bulk of the effusion which itself may give rise to impairment. In both these cases we have a suitable condition for infection to take place. This applies not only to blood but to other fluid, as for instance fluid from an ovarian cyst.

The great omentum and the peritoneum covering the under surface of the diaphragm are especially concerned in the process of absorption in cases of infection of the peritoneum, and this probably accounts for the fact that the omentum is always, when it is free to move, to be found at the seat of inflammatory trouble, whether in the pelvis or not. It may be regarded as a mobile column always ready to advance to a threatened spot and in this way it exerts a definite protective action for the peritoneal cavity. In this duty it often becomes adherent and so itself may later give rise to symptoms from the fact of its being adherent. Another result of its being fixed may be that if such a patient should have an acute inflammation of the peritoneum later on, say due to a gastric ulcer which has burst, the resisting power of the

peritoneum may be distinctly lessened from the fact that the omentum is unable to get to the focus of inflammation and so exert its chemiotaxic influence and help to wall off the fresh infection from the general peritoneum. The omentum being well supplied with blood and lymph vessels the phagocytic action of the effused leucocytes helps to protect the peritoneum from irritating organisms. Another phenomenon not infrequently noticed in cases of inflammation in the pelvis is the production of a diaphragmatic pleurisy, as a rule dry in character and not severe. This is of interest as shewing the connexion of the lymphatics of the pelvis and the diaphragm, probably through the lymphatics which accompany the tubo ovarian vessels from the pelvis to the crura of the diaphragm. What has been said in regard to the omentum as being a mobile column seems to apply to a lesser extent to the sigmoid flexure of the colon when it has a long mesentery, and also to the caput caecum coli when it is free to move, as in cases of inflammatory trouble these parts of the intestinal canal are frequently found adherent even when the focus of inflammation is quite removed from their normal site. I have been frequently struck with the fact that almost always, when there is a long mesentery to the sigmoid, it is found adherent to an inflammatory process, and even in right sided tubal cases and in appendicitis. When inflamed the peritoneum goes through the ordinary changes of inflammation - being a delicate pink -

at first later darker and livid, while serum is poured out in in variable quantities. This serum differs from the effusion of passive hyperaemia in that it has a greater percentage of solids, and in that it favors the formation of adhesions while the fluid of passive hyperaemia tends to prevent adhesions apart altogether from the bulk of fluid. We notice the difference in an effusion into the peritoneum in say a case of cirrhosis of the liver. Here we may have a large effusion and the abdomen be comparatively flat and lax. There is not the distension of the bowels which we get in an infective process, which seems to be another of Nature's methods of limiting the infection by favoring the formation of protective adhesions. It is often in those cases of infection of the peritoneum where there is very little effusion that a fatal result occurs - the infection having been so virulent that death results before the peritoneum is able to deal with it, while in those cases which have passed through a severe infection we find very many and dense adhesions, which, having performed their protective function - often at the expense of the organs involved, may now themselves mechanically give rise to symptoms. The endothelial cells shrink from each other - the lymph spaces are exposed, white blood corpuscles and lymph cells pass out to the surface and form masses of lymph. When a considerable amount of lymph is exuded it coagulates on the surfaces of the adjoining viscera forming flakes of membrane which can be peeled off.

It depends now on the way the case goes what becomes of this lymph. If the causal factor is kept up, these cells die and we get pus formation, while if it subsides the exudate which has formed is either absorbed, or becomes organized into connective tissue, forming adhesions. These strands become covered with endothelial cells and blood vessels grow into them, and sometimes these blood vessels are very numerous and large. It has been demonstrated that these adhesions also have definite lymphatic channels, which explains the question of infection by adhesions, to be discussed later. The adhesions so formed may be thin and velamentous and resemble a spider's web - the so-called "spider web-adhesions," or they may be shorter and more easily torn - the two adherent surfaces on separation presenting a ragged appearance - the so-called "bread and butter adhesions" or the adhesions may be thick and more firmly organized. These latter are, as a rule, the result of a long continued inflammation, or of repeated attacks of inflammation in each of which fresh adhesions are formed.

In different patients the amount of lymph and serum exuded varies, just as in the case of a pleurisy, when in one case there is great serous effusion, and in another great pleural thickening. So in the pelvis in one case we have great serous effusion and in another less effusion but organization of the effusion as it is formed and resulting fibrous thickening. The reason of this is not always clear,

but the chief factors seem to be the nature and virulence of the infecting organism, and the susceptibility of the patient to micro-organisms, and the general condition of the patient, especially in reference to chronic renal and cardiac disease. Though the adhesions so formed may be extensive, yet they may not persist, as they may after a time become absorbed, or at any rate stretched, so that they themselves do not give rise to any symptoms.

We may divide Peritonitis into 3 divisions viz.,

1. Serous.
2. Adhesive or plastic, the most frequent.
3. Purulent.

According to the nature of the infection there is 1. slight injection of the peritoneum with serum as a result, and the amount of this serum varies greatly - the so-called serous peritonitis, 2. Deeply colored peritoneum, smooth and shining but in parts unglazed and covered with exuded lymph - giving rise to the adhesive or plastic peritonitis, and the third condition where the peritoneum is livid in hue, rough in appearance with exfoliation of the endothelium, and with small foci of purulent lymph scattered over the effected surface, which is studded with small vessels. In a chronic peritonitis we are met with what are called serous cysts, also called Pawlick's cysts, which are really loculations amongst the intestines formed by adhesions and filled with serous fluid.

As a rule these loculi are small, but sometimes they may be of considerable size as in a case recorded by Targett (Trans. Lond. Obstet. Soc. Vol XII 1899) where there was a multiloculated cyst extending up to the umbilicus surrounded by a wall of adhesions. These cysts are always the result of a previous peritonitis, and seem to be most frequent in post-puerperal and chronic cases. In the pelvis they may be confounded with dilated Kobelt's tubules or with the hydatid of Morgagni, both of which may attain a considerable size. In a woman whom I operated on in February last, and who had had an abdominal section for a pelvic abscess after miscarriage done 5 years previously, and in whom a glass drainage tube has been used, there were several of these cysts, one of considerable size, and in the broad ligament also, there were a number of distinct cysts, apparently dilated Kobelt's tubules.

We may divide the causes of Pelvic peritonitis into 2 classes, viz., Direct and Contributing.

In the first class come organisms, which will be considered in the following order. 1. Gonococci, 2. Staphylococci, 3. Streptococci taken together, 3. Bacterium coli commune, 4. Tubercle bacillus. 5. Pneumonococci, 6 Other organisms, Diphtheria, bacilli &c.,

Gonococci. Infection is as a rule through the tubes or through the bladder or ureter, and not through lymphatics but by direct continuity of tissue, and the most usual cause is as the result of an ascending gonorrhoea

affecting the tubes, and causing perisalpingitis with plastic exudation. The infection tends nearly always to be limited to the pelvis, and, in the cases of general peritonitis following an attack of gonorrhoea, it would seem that the infection is as a rule a mixed one. The symptoms of gonorrhoeal infection are apt to first appear and subsequently to be more severe at the time of the menses, and as a rule younger patients suffer more than the older ones. In gonorrhoeal infection of the peritoneum itself the gonococci are as a rule eliminated during the acute stages, and the characteristic recurrent attacks, *seem to be due generally to a fresh infection from the tubes*. It is agreed by all investigators that gonococci are shorter lived and of less virulence in the peritoneal cavity than in other tissues, and that in gonorrhoeal infection of the ovaries, the gonococci tend to produce their greatest manifestation on the surface of the ovaries, with the result of producing an exudation on the surface of the ovary, and when this exudation has become organized, it hinders the rupture of the Graafian follicles. The adhesions bind the ovary down and prevent its return to its normal position on the subsidence of the infection. In gonorrhoeal infections the peritonitis is as a rule plastic, and the adhesions formed are generally dense and do not tend to become absorbed - mostly because the causal factor - salpingitis mostly, does not cease to act, so that here the adhesions are generally of less consequence than the original causative factor.

In the cases where there has been an occlusion of the tubes preventing for the time further infection - the recurrent attacks at the time of menses are due to hyperaemia induced by the mechanical action of the adhesions, or to the progressive accumulation of follicles of ovary which have been unable to rupture, and as secondary causes may be added constipation often associated with hepatic congestion and possibly active hyperaemia, as the result of trauma or excessive intercourse &c., The question whether the gonococcus can give rise to a general peritonitis has been much disputed, and the existence of a gonorrhoeal general peritonitis has been denied. Howard Kelly cites a case where there was a ruptured pyosalpinx operated on several days after rupture, and though the pus was lying free in the peritoneum, and was proved to contain myriads of gonococci, there was only the slightest local pelvic peritonitis. A few cases have been reported where the gonococcus has been proved to be the only organism present in cases of diffuse peritonitis. These cases are characterized by the mildness of the symptoms, and though there is considerable pain present, there is no intestinal paralysis and no shock nor collapse as in the ordinary acute general peritonitis. The peritoneum is deeply congested, with a heavy deposit of fibrin, but no serum nor pus. The constitutional symptoms are very mild in proportion to the area affected, but though this obtains as a rule, such cases may prove fatal. Braquehaye and Baginsky have each reported a fatal case, both in children (Centralblätt

für Chirurgie 1899.)

Staphylococci and Streptococci. These two present some differences. They may be taken as an example of post-puerperal or post-abortion infection, and as a rule the lymphatic spaces and vessels are the chief channels by which infection reaches the peritoneum in these cases. In this infection the origin may be in practically any lesion of the external genitalia, of vagina or uterus; but probably the commonest site is from the endometrium, and the pelvic peritoneum may be infected without any lesion of the tubes, owing to the lymphatic conveyance of the infection. This has an important bearing on the after treatment, as in these cases, by curing the ^{or}original focus, the result of this infection, e.g., protective exudates &c., may cease to give trouble. And it is in this class of cases too, that the adhesions tend to be absorbed. Another point is that there is less liability of getting occlusion of the tubes, and hence sterility, than in a gonorrhoeal or tubercular infection. But probably the infection that will give rise to the greatest number of adhesions and the greatest chance of sterility is a gonorrhoeal infection following a post-puerperal infection, which is quiescent, or has cleared up leaving a somewhat damaged peritoneum.

The peritoneum may be infected through the open ends of the tubes, or through the lymphatics, or both, but while the staphylococcic infection as a rule tends to become

localized, the streptococcic infection often tends to become generalized, so that we may have a tubal inflammation with a secondary peritonitis, or a pelvic lymphangitis with primary peritonitis. With both staphylococci and streptococci we get the usual effusion of lymph and serum, but in virulent cases, especially due to streptococci infection, we may have death before there is time for much peritoneal reaction. The virulence of streptococci varies, and it has been shown that some varieties, while non pathogenic by themselves, become so when associated with B. C. C. and other organisms. This is of importance in pelvic infection where there is always the possibility of infection from B.C.C. The absorption of toxins causes death by heart paralysis, nephritis &c., and naturally this result is more marked after any condition where the lymph channels are hypertrophied - after abortion &c., But generally the infection becomes localized, and here, after the acute symptoms have subsided - in one to two weeks, we find a tumour in the pelvis composed of the uterus and adnexa, intestines and omentum matted together with exudation and newly formed adhesions. It is at this stage that ~~exudation~~ a diaphragmatic pleurisy or a subphrenic abscess may appear the infection being apparently carried up by the lymphatics. I have seen two cases of this sort just lately, one in the right cupola of the diaphragm and the other in the left - both following a septic condition after abortion.

After 2 or 3 weeks as a rule the symptoms subside, but if it goes on to suppuration, then, according to the position of the exudate, we will probably get fluctuation in the posterior cul-de-sac - the commonest situation, or bladder symptoms, cystitis &c., due to the involvement of the bladder - or rectal symptoms tenesmus &c., Now the abscess may break or be opened at this stage, and the whole trouble subside, or it may go on to a chronic condition and the patient succumb to exhaustion, or active trouble may subside and the exudate left become absorbed, or become organized into connective tissue in the form of adhesions, and these, by contracting and binding the organs in an abnormal position, may become a further source of trouble, causing dysmenorrhoea, sterility &c.,

Staphylococcic infection here, like elsewhere, depends to some extent on the area infected and the number of organisms introduced, which is not the case with streptococci. In staphylococcic infection of the ovary, unlike with gonococcal, where the brunt of the infection is on the outside, the infection generally results in suppuration in the stroma of the ovary, but here too there is a great deal of exudation on the surface of the ovary with consequent adhesions on the surface.

Tubercular infection of the peritoneum may be either primary or secondary - probably most often secondary to tubal trouble or to infection from the bowel. The ovaries

seem to have a definite resistance to the T.B. probably due to the timely protective action of the peritoneum, by causing exudates and adhesions, or to the resistance of the tunica albuginea. In tubercular cases the ovaries themselves are generally found unaffected. The infection of the peritoneum may be through the blood vessels or by the lymphatics.

In both cases we get small nodules formed in the blood vessels beneath the peritoneum and then effusion round, with congestion of the peritoneum and ^{fol}exp~~l~~iation of endothelial cells with abundant formation of adhesions. Primary tubercular disease of the tubes is probably much more common than has been generally supposed, and many cases which have been regarded as gonorrhoeal from the macroscopic examination of tubes removed at operation, would be found to be tubercular if examined microscopically. In 10 cases in which I have examined the tubes removed at operation, and which presented no particular appearance of tubercle, I found typical tubercular appearance microscopically in 2. Bayea states that from 8% to 18% of cases operated on for ~~salpingiti~~ salpingitis are tubercular. The adhesions due to ~~the~~ chronic tubercular peritonitis are as a rule characterized by being much denser than other adhesions, but it is remarkable how even these adhesions may become absorbed, after laparotomy. Two cases I have notes of, in which I assisted at the operations and was present at the post-mortems subsequently, illustrate this.

Both patients were operated on for tubercular peritonitis, both with relief of the abdominal symptoms. At the operation in both cases the pelvis was one mass of dense adhesions, so that it was ~~impossibke~~ difficult to distinguish the pelvic organs, and the omentum and bowels were studded with tubercles. Both these patients died within a year of tubercular meningitis, and at the autopsy the pelvis was in one case found quite clear and in the other only a few adhesions round the adnexa, and the tubercles had disappeared from the peritoneum.

Another condition which is found in chronic cases, apparently most often, if not always a result of tubercular peritonitis, is a dense plaque-like exudate, cartilaginoid in consistency, which binds down all the pelvic viscera, so that at first it is often very difficult to distinguish them. There may or may not be tubercles present macroscopically, and it is in this class of case that a diagnosis of malignant disease is frequently made. This exudate cuts almost like cartilage, and quite obscures all the normal relations. It seems very often to be the result of an extinct tubercular infection. In the case of a young girl recently operated on by Dr. Hamilton at the Adelaide Hospital in which this condition was very well marked a microscopic examination of the tubes removed shewed them to be tubercular, though there were no tubercles present anywhere in the peritoneum and no pus or fluid anywhere in the pelvis.

In reference to peritonitis due to the Bacterium Coli Commune. This opens up a large and much disputed field for discussion. B.C.C. infection causes effusion of but little lymph and serum and the local and constitutional disturbance is slight. It has been questioned if the B.C.C. can per se, set up a peritonitis, and whether it is not necessary to have some other factor as trauma &c., present. It is a question which is rather difficult to decide. The adhesions found in young girls or women who have not been exposed to the risk of septic infection are very often put down as being due to a B.C.C. infection of the peritoneum, especially in cases where constipation has been a marked feature, but in these cases it is impossible to exclude other factors which might have caused them, as tubercle or a foetal peritonitis, or peritoneal infection in childhood either as the result of a vulvo-vaginitis, or following the exanthems, or as a result of typhoid.

It seems that there must be some impairment of the peritoneal covering of the bowel to allow the migration of the B.C.C. and this may take place in various ways. When any organ is placed against the bowel for a long time, as in the case of a retroflexed uterus, either by friction or pressure the peritoneum is so impaired that it allows of the migration of the B.C.C., and lymph is effused, and if this becomes organized we get delicate adhesions formed. This process may take place without any constitutional symptoms. And so in this regard we

we might conclude that the administration of opium in post-operative cases, where the peritoneum has run the risk of injury would tend to favour this migration. For infection of other organs by B.C.C. to take place, it seems necessary for the bowel to be adherent, but actual perforation is not necessary.

What occurs as a rule is an effusion of lymph causing delicate adhesions, and through these the B.C.C. tend to migrate and so cause infection. We know that B.C.C. are a not infrequent cause of cystitis and can frequently be demonstrated in the urine and they appear to get into the bladder through inflammatory adhesions to some part of the urinary tract.

Doyen and Schanta have recorded cases of salpingitis in which the causative factor was apparently B.C.C., and Raymond states that in all the cases of salpingitis which he has examined, he has only found B.C.C. present when the tubes were adherent to the bowel. And again, we know that in a gonorrhoeal salpingitis, it is often impossible to demonstrate the gonococci in the tubes after the acute stage has passed, and here a damaged condition of the peritoneum being present would allow of the infection by B.C.C. In the same way we get infection of ovarian cysts &c., by contact with the appendix vermiformis. In 3 cases of suppurating ovarian cyst which I have examined, to all of which the appendix was adherent, the only organism to be demonstrated was B.C.C. On the other hand symptoms of *appendicitis* may be set up by the infection of a previously healthy adherent appendix to a tube, which is the seat of a salpingitis.

The appendix may be found adherent to a pyosalpinx or other pelvic lesion, and yet be perfectly healthy itself, as in a case of right sided salpingitis I recently saw, to which the appendix was adherent, and yet microscopically was quite healthy, while in the tube I was able to demonstrate gonococci. It is certainly easy for the vermiform appendix to come into close relationship with either tube when a general enteroptosis exists, and it is not uncommon, apart from this, to find the caecum so moveable as to be able to rest on any part of the pelvis, and this indicates a probable source of reinfection even in left sided cases. Manton (American Journal of Obstetrics Jan 1903) says the appendix is involved in 8% of right sided cases, and maintains that right sided tubal disease, with thickening and adhesions running x up towards the caecum, invariably indicates involvement of the appendix while, Howard Kelly says the frequency of involvement of the appendix seems to him one of the strongest reasons for dealing with pelvic inflammation by the abdominal route. When a tube or ovary is infected with B.C.C. it seems as a rule to distend very rapidly and frequently ruptures into the bowels. So that probably we may take it that we do not get a primary B.C.C. peritonitis, unless there has been some previous inflammatory condition or some trauma which has lessened the resistance of the peritoneum to infection. That when infections occur in the pelvis the result of B.C.C., they take place through adhesions, and as far as

we know B.C.C. is not the primary cause of a tubal or ovarian infection. In examining the uterine discharge from post-puerperal cases while in Dublin, I was struck with the number of cases in which B.C.C. could be demonstrated in the uterine cavity - generally in association with cocci, but sometimes alone. Robb (American Gynaecology June 1903) gives the results of the bacteriological examination of 10 cases of sepsis following childbirth or abortion, in which the discharge from uterus and also the fluid removed from the posterior cul-de-sac was examined. In 4 of these cases B.C.C. were found in fluid from the cul-de-sac, in one case being the only organism found. In 3 of these cases there were B.C.C. found also in the uterine cavity, always in association with cocci. In 2 out of 3 cases of sepsis following abortion or parturition, in whom a posterior colpotomy has been done recently at the Adelaide Hospital I have found B.C.C. present in the peritoneal fluid, in both cases in association with staphylococci, in the third case I was unable to demonstrate any organisms.

Pneumococcic infection of the pelvic peritoneum may be taken as a definite entity from pneumococci having been isolated from the peritoneal fluid in cases of peritonitis. As regards results it conforms with staphylococcal infection and most of the recorded cases have been in young people following bronchopneumonia.

Pneumonocococccic infection of the tube is said to be always unilateral.

Diphtheritic infection of the peritoneum is also described and seems to be commonest a few days after confinement, and the infection travels from some local lesion of genitals or vagina. A patient whom I saw at the Chelsea Hospital with a diphtheritic patch on the cervix uteri, from which the pathologist isolated Loeffler's bacilli by cultures, developed a tuboovarian abscess 3 weeks later, the infection apparently arising from this patch, but no bacteriological examination was made at the time of the operation. In these cases, it must necessarily be very difficult to exclude other organisms as being the cause of infection.

Typhoid bacilli have also been described as being the cause of pelvic peritonitis, apparently acting in the same way as B.C.C. Different other organisms have been demonstrated as the causal factors of post-operative peritonitis, having apparently been introduced at the time of the operation.

Infections from micro organisms we may designate as the direct causes of peritonitis, but there are other causes which contribute to their results. Inability of patient to resist infection from any cause, but especially in cases of chronic renal and cardiac disease. Chronic constipation and hepatic congestion often found together.

Exposure or any other condition giving rise to hyperaemia, and hypertrophy of the lymphatic system as after abortion &c., Another factor having a marked contributing effect is the time of the infection. Any infection is more likely at the time of menstruation, especially gonorrhoea. In the female pelvis there are periodical changes occurring, which constitute in themselves the initial changes in inflammation, simply from a plus of the normal physiological function, and this without the presence of any organisms at all. It is agreed by all investigators that there is normally an absence of micro-organisms above the cervix, though from an anatomical point of view we would expect the uterus and adnexa to be favorably placed for the presence of numerous organisms. This being the case, we can see that apart from infection from other organs, the pelvic peritoneum is hardly likely to be infected primarily except perhaps by tubercle-bacilli. How then is the presence of adhesions found with cysts of non-inflammatory origin and tumours in the pelvis to be accounted for? In many cases as for instance fibroids, accompanying disease of the tubes will account for the infection, but in any of these cases apart from such infection we have a suitable condition for the infection ^{by} B.C.C.

The tumour or cyst, by pressure or friction, gives rise to an impaired condition of the peritoneum which allows of B.C.C. migration. St Sanger has stated that an aseptic accumulation of blood in the pelvis, as for instance in a ruptured tubal pregnancy, can give rise to a localized peritonitis,

but this does not do away with the presence of organisms.,
as here too a suitable condition for B.C.C. infections obtains.

The absence of bacteria above the cervix is of interest in regard to cases of haematosalpinx and hydrosalpinx. While these conditions are as a rule looked on as a distinct stage of a salpingitis and perisalpingitis, causing occlusion of the ostium with accumulation of fluid in the tubes, it has recently been denied that this is always the case. Rio Branco and Descomps (Bulletins et Memoires de la Soc. Anat de Paris June 1902) have asserted that a hydrosalpinx is very often a primary cyst, and White (British Journal of Obstetrics and Gynaecology Mar 1903) accounts for the adhesions found ~~round~~ *in these cases, as being exactly like the adhesions which occur with* any tumour in the pelvis, e.g., as being a result and not a causative factor of the hydrosalpinx. Menge, from the fluid of a large number of cases of hydrosalpinx has been unable to demonstrate the presence of any micro-organisms, either by culture or by the microscope. White contends that a large number of these cases of hydrosalpinx are due to congenital occlusion of the tubes, and says it is not justifiable to look on them as inflammatory in origin because we find adhesions present at the operation. Doran (Trans. Lond. Obstet. Soc Vol XXXI 1899) has shown, that as a result of puerperal infection, it is possible to get a perimetritic closure of the tubes resulting in hydrosalpinx, essentially inflammatory in origin, though the tube itself has never been inflamed.

In either case the presence of adhesions can be explained. In reference to the occurrence of peritonitis with the formation of adhesions in post-operative cases, we have here the two additional elements of trauma, and the practical impossibility of excluding definitely micro-organisms at the operation. By many observers it is held that post-operative peritonitis of whatever degree is septic i.e., due to pathogenic organisms. But we must admit the possibility of getting a simple plastic peritonitis as the result of infection of various chemicals into the abdomen of animals. It may be, that in the simple post-operative peritonitis such as occurs after any abdominal section, the peritoneum is able to destroy the causative organisms, but in many cases where it has been tried to obtain growths of organisms from the peritoneum during and at the end of the operation the result has been negative. We must rather recognize a peritonitis as an attempt on the part of the peritoneum to repair local injury, and this I take it, is how we should look on the peritoneal adhesions formed as result of say a ventrofixation. Simple plastic peritonitis occurs in more or less degree in every case where the abdomen is ~~apexated~~ opened and is to be regarded as a regenerative process. The question, whether non-infected areas in ^{the} peritoneum and sutures, can give rise to effusion with consequent adhesions, has been said to depend on whether the injury has gone below the serous surface; as where there is no sepsis the serous cells heal over the raw surface.

Jesser denies that adhesions can be formed simply by trauma if there is no infection, but as we have seen it is impossible always to exclude infection. It seems reasonable to suppose that the more the peritoneum is exposed and handled, apart altogether from the increased risk of infection from without, the more likely it is to become the seat of an inflammatory effusion with the possibility of formation of adhesions. The same applies to irritation of peritoneum by chemicals and antiseptics and also to the choice of ligatures, whether absorbable or not. In either case the ligature, is for the time being a foreign body, and there will be effusion round it and possibly adhesions formed to the omentum, but while an absorbable ligature soon ceases to act as foreign body, an unabsorbable one remains, and at best becomes encapsuled after a time, but the adhesions already formed are stronger and less likely to be absorbed. Theoretically an aseptic unabsorbable ligature when used in an aseptic cavity ought to become encapsuled and remain buried, but very often they do not, and such ligatures are a frequent source of trouble afterwards. The organized inflammatory tissue round the ligature is poorly nourished tissue, and we know that micro-organisms have an affinity for injured tissue, so that in any place near the bowels we can see how it may become a source of latent danger. A section of a small tumour removed from the pelvis of a patient who had had a salpingo-oophorectomy done 2 years

previously, and who had had pain in that side ever since, shewed a piece of silk practically unaltered, except for infiltration of a few leucocytes through the strands of the silk. These inflammatory tumours, which, though generally small, may be of considerable size, present histologically the appearance of a fibro-sarcoma, but clinically are not so. and I have seen several such cases when a second operation was necessary from the pain caused by the adhesions attached to such a focus.

Djendil Pascha (Centralblatt für Chirurgie No. 39, 1897)

records case of a tumour in the omentum and transverse colon following radical cure for hernia. The tumour ^{gave} rise to symptoms of intestinal obstruction. After removing the tumour and resecting part of the bowel a piece of silk ligature used to tie off the omentum at the previous operation was found in the centre of the tumour, which microscopically was a fibro sarcoma. The after history of the patient is not given.

Braun (Annals of Surgery May 1902) records 30 cases of abdominal and omentum tumours the result of inflammation round silk ligatures used in the abdominal cavity. The tumours varied in size up to that of an orange. In 14 out of the 30 cases the tumours disappeared after some time. Braun says they may occur from 4 weeks to 3 years after operation, and as a result of his observations advises catgut always to be used in the abdominal cavity.

Two cases I have recently seen, both of whom had had the ovaries resected, one 18 months the other 2 years previously, and in whom a second operation was necessary, shewed the ligatures, in both cases tendons, shining through a layer of inflammatory organized tissue, and in both cases the ovaries being adherent in Douglas' pouch. On cutting sections through these buried tendons, there was considerable infiltration of the strands of the tendons, by leucocytes, and apparently the tendons would have been absorbed in time, but whether the adhesions formed round them would also have been absorbed is difficult to say. In another case where a patient had had his appendix removed 8 days previous to death from cerebral embolism, and in which I had a chance of examining sections of the catgut used to tie off the stump, the condition was very different, as here after 8 days there was marked infiltration and commencing absorption of the catgut. Naturally the exudate formed here would be more likely also to be absorbed and so not give rise to trouble afterwards. The protective peritonitis occurring as a result of malignant disease is of course quite secondary and unimportant in comparison with the causal factor. One fact worth mentioning in this connection is that in some cases the malignant disease seems to spread rapidly along these protective adhesions, possibly through the lymph vessels in them.

Probably the most common cause of this condition is where the peritoneum is invaded by papillomatous growths, the result of rupture of papillomatous cyst of the ovary. In this condition too, we get the encysted collections of fluid in the peritoneum similar to the condition that is found in tubercular peritonitis.

Symptoms & Results.- Here we must remember that pelvic peritonitis is generally a secondary result, and also that inflammation of the pelvic peritoneum seems to occur with less violence than inflammation in the upper abdomen and peritoneum generally. In the acute stages the symptoms are those of the causal factor with exacerbation in severity when the peritoneum itself becomes involved. This applies particularly to the pain present, to the fever and the pulse rate. In the great majority of cases, a chronic pelvic peritonitis so called, is the result of and continues with ~~some~~ some chronic tubal or uterine inflammation, and as such can not be said to have a definite symptomatology of its own, but when that causal trouble has become dormant or been cured, then the peritonitis exudates may give rise to symptoms, and these symptoms are protean. The symptoms will depend to a great extent on the position of the exudates and adhesions, on their density and their duration, and on the organs they involve, and the position of those organs at the time they have become involved, or that they have assumed as a result of their involvement.

And also on the cause of the adhesions and whether that cause has ceased to act, in which case we may put the symptoms down as being directly due to these exudates, but if the exciting focus has not ceased to act, then only part of the symptoms may be due to the involvement of the peritoneum. In the same way that the presence of adhesions about the gall bladder may give rise to all sorts of symptoms, so those in the pelvis may give rise to all sorts of obscure symptoms and vague pains, sometimes very severe, and often making life a misery and perhaps causing the patient to be put down as hysterical or hypochondriacal.

Pain is the most marked feature and will be considered first. K. G. Lennander (Mitteilungen aus den Grenzgebieten der Medizin und Chirurgie 1902.) as a result of his experiments and observations during operations has come to the conclusion that it is only the parietal peritoneum which is sensitive, and that the serous covering of the abdominal viscera, and all those organs exclusively innervated by the sympathetic system, are without sensibility. He maintains that none of the organs so supplied, and the peritoneum comes under this category, can be the source of pain unless it is adherent to the parietal peritoneum or an inflammatory process originating in the same, which has progressed to the parietal peritoneum. This being so would account for the fact that we do not necessarily get pain always when adhesions are present.

But when we come to analyze it further it does not seem adequate to explain all cases where pain is present, e.g., apart from the causative focus being still active and giving rise to fresh infection. Ovarian tumours, for instance, are as a rule painless unless complicated by adhesions, i.e., apart from any acute condition as twisting of the pedicle, but ovarian tumours or any tumour may be densely adherent and still not cause pain, as a case which will be quoted later illustrates. And though the presence of pain with tumours very often is due to adhesions it is not always so, as for instance the presence of pain with fibroids as a rule indicates some commencing degeneration. And then in many cases with adhesions present, there may be no pain, and in other cases with apparently similar adhesions there is great pain. When adhesions are present which do not involve the parietal peritoneum, and which cause pain, we frequently notice that the area of this pain does not coincide with the position of the adhesions, in other words that the pain is referred. We very frequently find patients with pelvic disease who complain of pain down the legs or on the surface of the abdomen quite above the pelvis. Such pains are frequently spoken of as reflex pains, or as being due to pressure or stretching of the nerves going to that particular spot, but frequently at operation we find adhesions and other lesions which anatomically do not explain the pains and yet after release of such adhesions the pain is cured.

Admitted that we do at times get a neuritis, say from trauma at labor, or as a result of some infection causing inflammatory exudate pressing on the nerve filaments and giving rise to constant pain or loss of power of movement, in the same way that the intense pain accompanying phlegmasia alba dolens is considered as due to the accompanying neuritis, still this does not account for all cases where pain is present. From the pelvic viscera a continuous stream of energy passes to the spinal cord via the sympathetic. In the spinal cord there are cells which are concerned with motor, sensory and secretory functions. When there is any disease of the pelvic viscera there is an increased amount of energy passes via the sympathetic to the spinal cord and here it may affect neighbouring cells and so act as a stimulus to them, and produce symptoms according to the function of the nerve cells so stimulated e.g., motor, sensory or secretory. The sympathetic is really the nerve supply of the viscera as apart from the somatic nerves which supply the abdominal wall &c., In the same area of the spinal cord, cells are present which correspond to different areas of distribution by different nerves, so that a stimulus arising from a diseased viscus reaching the cells connected with a sensory nerve in the spinal cord, causes the pain to be referred to the peripheral distribution of that nerve in the external body wall.

so that we we may get hyperaesthesia of skin quite remote from the focus of trouble. And the same also with a motor nerve - the stimulation results in the contraction of the muscles supplied by that nerve, hence in pelvic disease we find the abdominal muscles rigid, mostly on the side of the focus of trouble, but there may be hyperaesthesia and rigidity of the abdominal muscles generally, and here we get a condition simulating symptomatically a general peritonitis. Also in the case of secreting nerves, as bladder irritability the result of some pelvic trouble not necessarily involving the bladder wall at all. The law regulating the distribution of pain in visceral disease is dependent on the fact that when a stimulus reaches a sensory nerve in any part of its course from the periphery to the brain, the resultant pain is always felt in the region of the peripheral distribution of that nerve. Head (Brain Vol XVI 1893) gives the following connexions for this referred pain.

| | | |
|--------|---------------------------|--|
| Ovary | Connected with segment of | 10th dorsal nerve. |
| Tube | " " " " | 11th & 12th dorsal nerve |
| Uterus | " " " " | 10th, 11th, 12th dorsal nerve, 1st, 2nd, 3rd 4th sacral. |
| Rectum | " " " " | 2nd, 3rd, 4th sacral. |

The sympathetic supply of the pelvic viscera is by the hypogastric with its various smaller plexuses and these have connexions especially with the 3rd and 4th sacral nerves. Affections of the serous covering itself does not cause referred pain, but local pain, which follows the lines of the peripheral nerves and is associated with deep tenderness over the affected point only, so that the referred pain in cases of adhesions must be taken as being due to the involvement of particular organs by the adhesions. The lumbar and sacral plexuses are quite behind the peritoneum and in the substance of the muscle, so that apart from a gross tumour or extensive inflammatory trouble they are hardly likely to be directly involved.

Pain would naturally be expected to be present in cases of old perisalpingitis at the time of the menses, due to the engorgement of the uterus and adnexa at that period. This has already been mentioned in dealing with gonorrhoeal infection. The dysmenorrhoea of salpingitis complicated by adhesions begins as a rule several days before bleeding starts, and unlike the pain with ante flexion lasts as a rule right through through the period. And even though the tube itself is practically normal and all trace of inflammation has disappeared from the lumen of tubes and uterus, yet the adhesions, if extensive, may give rise to so much pain as to demand operation not on account of danger to the patient's life, but to relieve her from this intolerable dysmenorrhoea.

Naturally in these cases we cannot differentiate between the pain due to involvement of the tube, and that due to involvement of the ovaries, as they are mostly associated together. In cases where there is an organized exudate on the surface of the ovary which prevents the rupture of the Graafian follicles we have the causal factor of the so called "ovarian dysmenorrhoea" and also of the condition of micro-cystic degeneration of the ovaries. In this condition we may get not only the ordinary dysmenorrhoea but the so called "Mittel-Schmerz" from the fact that ovulation is not necessarily synchronous with menstruation. Another factor of the pain is too the exudates binding the ovaries and tubes in abnormal positions in the pelvis. The contraction of exudates formed on the surface of the ovary may be of such a degree as to produce a sclerosis or fibrosis of the ovary, such as occurs in those cases which develop dysmenorrhoea after some inflammatory attack in the pelvis. At first, after the acute steps are past, the menstrual period may be one of actual relief, passing gradually into one of great pain. We notice this especially in cases of acute salpingo-oophoritis passing gradually into the chronic condition without treatment. Or again atrophy of the ovary as apart from fibrosis may apparently be caused by adhesions, causing either a temporary or a permanent amenorrhoea. Pozzi has remarked that we may even get a premature menopause and the following was probably an instance of this.

A. Mc.D. Aet 29. First seen Feb 1901 giving the following history. Married 6 years 1 child 5 years and 3 months previously. Complained that her periods had ceased for the last 3 months. After the child was born patient first began to have dysmenorrhoea, and 2 years later was operated on. I found this operation was for tubercular peritonitis, and at that time the uterus was retroflexed and all the pelvic organs were densely adherent, so that nothing was removed. After the operation the patient's general condition improved, but the pain at the menstrual period increased and the amount lost gradually decreased. During 1899 her menses were very irregular and lasted only 1 day as a rule, but there was always severe pain. At the end of 1900 they ceased altogether. In Feb. 1901 patient's general condition was good. There was no anaemia and no symptoms nor signs of tubercle. The breasts were flaccid. P.V. Uterus about normal in size, but fixed in retroflexion, and dense adhesions felt in either fornix. I have seen the patient frequently during the last 2 years and the period has never returned. On questioning, she says that the sexual appetite, which was previously well marked, has gradually decreased since the end of 1900. In August 1903 the breasts were flaccid and the gland tissue has apparently atrophied. P.V. Atrophic changes in vagina-uterus small - still retroflexed and adhesions to be felt on either side.

(The patient's husband has been in Western Australia for the last 8 months, which probably helps to account for the atrophic changes in the vagina.) Sexual appetite still in abeyance. Patient's general condition good, and her increase of weight has been maintained. There are no symptoms from her retroflexion, just as we would expect in a post-climacteric condition. In this case I take it that the adhesions round the ovaries have probably produced an atrophic condition leading to a premature change of life.

Bladder symptoms, the result of adhesions are fairly frequent, but we notice how infrequent adhesions between the anterior uterine wall and the bladder are, in comparison with those found on the posterior aspect of the uterus. This is probably accounted for by the fact that in a great number of the cases of pelvic peritonitis the infection is secondary to tubal trouble, and that the ostia of the tubes are normally on the posterior aspect of the broad ligament, and that pelvic exudates tend to gravitate into the pouch of Douglas. The effect of effusion is to bring about a condition of fixity. Effusion round a bladder which has been neglected in over-distension may cause the bladder to be fixed in that condition. In the same way with a rectum chronically distended or contracted at the time of effusion. Another factor too is the more frequent alteration of the volume of the bladder than of the rectum. The bladder being constantly filled and emptied would not tend to become fixed, and if adhesions did

form they would tend to be stretched - a sort of natural massage. This too indicates the line of treatment in cases of exudates forming round the rectum. The following case illustrates the effect of adhesions in giving rise to symptoms of pain, frequently^{cy} and in this case apparently to in-continnence. E. M. aet 22. single. Complains of inability to hold her urine, more especially at the time of menstruation, during which period she has great pain and frequent~~ky~~ of micturition. Has been treated with medicine for some years. P. V. Vagina and urethra normal. Uterus retroverted but comes forwards not very freely. On opening the abdomen several strands of adhesions were found stretchedg from the tubes and uterus to the posterior bladder wall. Adnexa apparently normal. These adhesions were freed and the uterus suspended, and since that time the patient has been quite free from trouble. In this case there was no history of pelvic inflammation, but the symptoms had started some few months after an attack of typhoid 6 years previously. We must recognize, that retro-displacements fixed or moveable can, per se, give rise to bladder symptoms by interfering with the utero-~~kistak~~ vesical connexions, and that these symptoms may be quite relieved by correcting the uterine displacement. And this applies particularly to those cases of uterine displacement accompanied by some degree of prolapse. From the frequency with which inflammatory conditions occur in the female pelvis we would expect stricture of the rectum and sigmoid flexure of the colon

to be a common result, especially as in cases where there is a long mesentery to the sigmoid it is so often found at the focus of inflammatory trouble, and we get the sigmoid kinked at different angles forming the "W" and "V" shaped sigmoid flexure fairly frequently, even apart from inflammatory trouble, where we would expect the inflammatory exudate to accentuate these conditions, by forming adhesions between the limbs of the sigmoid. But though obstinate constipation and ballooning of the rectum are common, stricture is not, unless due to malignant infiltration. But adhesions between the rectum and sigmoid and the adnexa or the uterus do fairly frequently produce changes in the peristalsis and nutrition of the bowel - giving rise to catarrh or distension ulceration with consequent diarrhoea, or dilatation leading to coprostasis and possibly ileus or paralysis, which may end fatally. Rectal adhesions would tend to be stretched when the bowels were opened, and the pain so caused may be another factor in increasing the tendency to constipation. It would seem that obstruction of the rectum does not occur unless there is considerable perirectal infiltration, and when perirectal adhesions tend to cause constriction it is practically always in the upper third of the rectum where the lumen is narrowest. Such cases as a rule tend to clear up of themselves if time is allowed, but may cause such acute symptoms as to necessitate a colotomy.

As before mentioned it is sometimes a difficult matter to estimate which of the symptoms are due to adhesions and which are due to some other lesion which may be present. This applies particularly to cases of retrodisplacement - retroversion and retroflexion. By many authorities it is held that a simple uncomplicated retrodisplacement gives rise to no symptoms, and certainly we do occasionally see such cases. There are a great number of cases of retrodisplacement which are complicated by adhesions, and these practically always do give rise to symptoms. On the other hand cases of simple retrodisplacement are met with which give rise to practically the same symptoms as when there are adhesions present. We must remember that a retrodisplacement is generally accompanied by a more or less complete prolapse of the ovaries, and this itself may give rise to symptoms. Granted that a simple uncomplicated retrodisplacement does not give rise to any symptoms, it does not follow that it will never give rise to any. We might argue the same of cases of error of refraction or of cardiac and renal disease which are discovered by accident. Inherently the causes which produce retrodisplacement engender the complications, by alteration in the circulation, produced by the plus of venous tension, favoring inflammation in the cavity, of and outside the uterus. And in the pelvis there is always the possibility of infection, and as we have seen, it is this infection that determines the presence of adhesions.

So that here the prophylaxis is to correct the displacement and so lessen the chance of future infection with resulting adhesions. The greater number of cases of fixed retropositions are a result of, or occur with, chronic tubal and ovarian disease, with all their invalidizing possibilities, and it is to this class that Reed refers to, as among the most distressing and persistent of walking diseases. Of 390 Gynaecological cases I have seen at the Out-Patient Department during the last 2 years in 70 the uterus was in a position of retrodisplacement, and in 37 cases there were adhesions interfering to a greater or less extent with its mobility. Of the other 33 cases 22 were cases in which the uterus was retrodisplaced as a stage of descent of the uterus mostly due to tears in the passages, but in which the uterine body was apparently not fixed by adhesions. In the remaining 11, in none of whom the support below was deficient, and 8 of whom had symptoms more or less directly referable to the displacement, the uterus, except in 2 cases to be mentioned, could be got forward, and there was apparently no fixation. The 2 excepted cases were diagnosed as being fixed retrodisplacements, one of these under anaesthesia, but on opening the abdomen the uterus was found to come forwards quite freely and there were no adhesions. In both these cases there were well marked utero-sacral or rather utero-rectal ligaments, and the fundus had apparently become caught between these, and on bimanual examination seemed fixed.

Both patients were single, and there was no history of inflammatory trouble, but one case had previously been dilated for dysmenorrhoea, due, she said, to ante flexion. Vedeler maintains that in 40% of cases of retrodisplacement there are no symptoms, and that symptoms, when they do arise, are secondary, and due to interference with the functions of conception, pregnancy and menstruation - to chronic metritis and endometritis produced by the displacement, to pelvic peritonitis and accompanying disease of the appendages. Probably cases of retrodisplacement giving rise to no symptoms would be more frequent in private practice than in Hospital patients.

In regard to ^{the} presence of adhesions influencing pregnancy. As a rule patients with extensive adhesions are sterile, probably ^{due} to the preceding causative factor of the adhesions - endometritis &c., or to occlusion of the tubes, But when such patients do become pregnant, the pregnancy may or may not be abnormal. If the adhesions are not too firm they may be stretched by the growing uterus as apparently happened in the following case. M. W. aet 23. married 4 months. Complains of severe dysmenorrhoea and great pain when the bowels are opened - especially at the time of menstruation. P.V. uterus ante flexed and retroposed - being apparently fixed back to the posterior wall of pelvis, and could not be got forwards even under anaesthesia.

No history of inflammatory trouble except typhoid 10 years previously. Two months later patient became pregnant. During the first 5 months the patient suffered from severe dragging pains in the lower abdomen and was obliged to stay in bed for 6 weeks on account of severe vomiting. At 4 months gestation the uterus was forwards, but there was still a tautness in the ^{posterior} first cul de sac. After 5 months the pains gradually ceased and the child was born at full time. A year after confinement the uterus was normal in size and position, and mobility was unimpaired. The periods have been present for 6 months, the patient has practically no dysmenorrhoea and the pain in ^{the} bowel during and after defaecation has quite ceased. This pain, she remembered having had, from the time menstruation first appeared at 14. Here too the adhesions present may have had something to do with the exaggeration of the vomiting of pregnancy. Taylor (Ann. of Gyn. and Pediatrics May 1901) says the vomiting of pregnancy may be kept up and exaggerated by the presence of bands of adhesions running from the growing uterus to various parts of the intestinal canal. In the case above apparently the adhesions had become stretched by the growing uterus, but when they are strong and ~~ht~~ fibrous they seem to be a frequent cause of recurrent abortions., generally about the 3rd ^{to} and 5th month. While the uterus is growing, from some sudden movement the adhesions may be ruptured, giving rise to sudden pain and shock. This was so much the case in one case I saw in England, that a diagnosis of extrauterine pregnancy was at first made.

The patient had had amenorrhoea for 10 weeks, and was brought to the Hospital complaining of sudden severe pain in the pelvis after jumping off a step-ladder. Temperature was subnormal, pulse 130-140, and patient looked altogether like a ruptured ectopic case. No vaginal bleeding, but vaginal examination shewed uterus the size of a 3 months gestation, and an indistinct boggy feeling behind the uterus, which was in good position forwards. After a few days rest the condition cleared up. On looking up the notes of her previous attendance at the out-patient department, it was found that at her last attendance 6 months previously, the uterus had been retroflexed and fixed, and she had been advised to have an operation. After finding out the previous condition the diagnosis of pregnancy in fixed retroflexion with sudden bursting of the adhesions was made. J. W. Taylor (B. M. J. April 1903) cites the case of a woman who had had 4 miscarriages in 3 years, apparently due to the adhesions the result of an old appendicitis, and after the removal of the appendix and breaking down the adhesions she had several children without trouble.

Salpingitis with adhesions is certainly a serious complication of pregnancy, and some American authors even advise that a patient who is known to have extensive adhesions should be warned against running the risk of pregnancy. The adhesions produced by ventrofixation might act in the same way if the patient became pregnant, and if the

adhesions are stretched, they probably would not contract again after pregnancy with involution of the uterus, as they are fibrous tissue. In this respect the operation of ventrofixation differs from operations for shortening of the round ligaments, which, as they do contain muscular fibres, would contract pari-passu with the uterus. In this respect I may cite the following case whom I have seen just recently. She came complaining of symptoms of miscarriage at about 3 months. She had had a ventrofixation done 8 years ago, silk being used for fixing the uterus. She has had two children since, both labors being difficult, and instruments having been used. The last time, 2 years ago, she was in labor for $2\frac{1}{2}$ days. P. V. examination showed the uterus large and ~~silk~~ soft, and fixing it to the anterior abdominal wall could be felt a strong band. On pressing the cervix backwards a distinct depression could be seen in the lower part of the old scar, which was otherwise good. Previous to the ventrofixation 8 years ago the patient had had 3 children - all labors being, from her account, exceptionally easy. In this case apparently either the uterus had developed at the expense of the posterior wall, or the bands must have stretched, but judging from how firmly the fundus was attached to the anterior abdominal wall I should think the former condition took place, and hence the dystocia. We have seen in reference to ligatures that probably the bands formed as the result of using an unabsorbable ligature, such as silk, would be stronger and firmer than those formed as the

result of an absorbable one, and especially so in the case of a ventrofixation as distinct from a ventrosuspension. In 5 cases at the Adelaide Hospital in whom a ventrosuspension had been done at periods varying from 6 months to 2 years previously, ^{catgut being used} and in which I had the opportunity of seeing the abdomen reopened, in only one was there any sign of a suspensory ligament. In 3 of the cases the uterus was again retroverted at the 2nd operation and in none of the cases had pregnancy intervened between the 2 operations. Another woman I saw recently seems worth mentioning here. C. F. aet 28. 2 para the last 3 years ago. In May 1901 had Emmett's operation for repair of cervical tear and in June 1901 had ventrosuspension done for fixed retroflexion using Kangaroo tendons. On 16.8.02 had miscarriage of quadruplets at 6 months - all being born alive, with 12 hours interval between the first and fourth. She had retained placenta and was curetted. On 24.3.03 pelvic examination disclosed a bilateral tear of cervix - uterus in good position and freely moveable. No bands to be felt anteriorly, but patient says that during the time she was carrying she had severe dragging pains radiating from the old scar, and great frequency of micturition. In these cases of ventrosuspension we endeavour to get the formation of bands of adhesions to hold the uterus in position, temporarily at least, till the proper ligaments recover their tone. We know that cases of retrodisplacement - the result

of deficient support below, are often prevented from becoming prolapsed by the occurrence of a pelvic peritonitis resulting in adhesions holding up the uterus. In the same way Pryor treats retrodisplacements by opening Douglas' pouch, and by the introduction of gauze endeavours to get bands formed behind the uterus to pull the cervix backwards. The same principle underlies Ferraris operation (Archiv. Italiano di Ginecologia Dec 1902)

Adhesions of the intestines and short omental adhesions pulling on the stomach and transverse colon are a common cause of persistent pain in the lower part of the abdomen, of griping, and sometimes of vomiting e.g., apart from intestinal obstruction. The omentum being fixed below would naturally interfere to some extent with the ~~xx~~ mobility of the stomach, and tend to pull both the transverse colon and the stomach downwards, so that in such a case we would have increased stomach resonance. An interesting case illustrating this is the following. M. F. aet 30, Nullipara. Was operated on 9 months ago, when the appendix and the right tube and ovary were removed and a ventrosuspension was done, using silk ligatures. The wound suppurated and did not heal up for 3 months. Since the operation patient says she has suffered greatly from indigestion and flatulence, though previously she was quite free from such trouble. She gave the following history on the day I first saw her 16.4.02. Six days ago, after eating mushrooms, she got a severe pain, first in the right leg -

later on in the epigastrium. She vomited several times. She was under treatment outside, the vomiting being fairly continuous. Bowels were opened after enema the morning of admission. The pain is now localized low down in the right iliac region and shooting down the right leg. T. normal. Pulse 90. Stomach resonance markedly increased extending down to the ~~nx~~ umbilicus, and it can be seen to be distinctly bulging over stomach area. P.V. uterus forwards and pulled to right, with feeling of fullness in right fornix. No peritonitis present. The vomit was faecal once after admission. The diagnosis made at the time was partial obstruction of the bowel, probably due to some adhesions kinking the gut, and the dilatation of the upper part of the abdomen - apparently the stomach and transverse colon, was put down as being due to the fixation of the omentum at the seat of the old operation causing dragging on the stomach. After putting the patient in the knee chest position, and washing out the stomach several times the ~~symptoms~~ symptoms gradually subsided. The patient refused any further operative treatment. Six months later she contracted acute pneumonia, and died, when I had the chance of seeing the condition in her pelvis. The sigmoid flexure, which had a long mesentery, was found adherent to the stump of the right tube, and the great omentum, which was short, was found densely adherent in the ~~right~~ same neighbourhood. The transverse colon was pulled downwards in the form of a V, and the greater curvature of the stomach was also lower than usual.

What had probably given rise to her symptoms previously, was the dilatation of the stomach from some error in diet, causing dragging on the omentum which had kinked or partially occluded the lumen of the sigmoid flexure, giving rise to a partial obstruction of the bowel. As above we have seen that the presence of adhesions may induce a condition of ~~suitxx~~ inability to go through gestation owing to occurrence of abortions, but probably one of the most important conditions produced by adhesions is absolute sterility due to blockage of the fimbriated end of the tubes. In the great majority of cases where there has been a severe attack of perisalpingitis present, especially gonorrhoeal and tubercular cases, we find this condition present either on one or both sides. Repeated attacks of perisalpingitis from whatever cause will give rise to the same condition. Pozzi says that he looks on permeability of the fimbriated ends of the tube as pathognomonic of simple catarrhal salpingitis which is curable without extirpation. This does not mean that any tube which at operation is found to be occluded is to be extirpated. In cases of hydrosalpinx, which as we have seen are mostly sterile, and in mild infections, and if the patient is very anxious to have children, an artificial ostium can be made, and Penrose has cited a case of pregnancy following such a conservative operation. We have already mentioned that cases of puerperal infection are less likely to become occluded than cases of gonorrhoeal infection

T. W. Edin. (Trans. Lond. Obstet. Soc. 1803.) holds that if any infection is at all chronic we are almost certain to get occlusion of the fimbriae of the tubes.

In regard to the question of what share the presence of old inflammatory exudates have in the production of extrauterine pregnancy, it is hard to say much very definite. Practically all writers give them a place in the aetiology of that condition, but some attach a great deal more importance to their presence than others. Pozzi believes the presence of adhesions of ovaries and tubes, the result of a perisalpingitis, is the commonest cause of extrauterine pregnancy, but later researches seem to place more weight on the condition of the endothelium of the tubes, though Bland Sutton (Surg. Diseases of Ovaries and Tubes 1896) considered a healthy tube as more likely to become pregnant than one which had been inflamed. Adhesions are supposed to act as a cause by narrowing and disturbing the lumen of the tube on their contraction. Opitz (Zeitschrift für Gebürts und Gynäkologie 1902) asserts that tubal gestation is due to the ovum being lodged in small diverticula formed by adhesions of the mucosa, and as a cause of these diverticula he gives an important place to peritonitic adhesions causing obstruction of lumen of tube or by causing traction on the tube and so kinking it.

Reed has reported 2 cases of extrauterine pregnancy as occurring in accessory diverticula of the tube, which he takes as congenital, which would go to support Opitz's views. I have seen during the last two years 3 cases of accessory diverticula of the tube in specimens removed at operation, and the condition may be commoner than is generally supposed.

Norris (Pathology of Pregnancy) says that while a variety of causes may operate in producing this condition, it is most probable, from the frequency with which old inflammatory disease is found coexisting on the other side, that most cases of tubal gestation arise from ileus of the tube, resulting in an inability to transmit the contents of the tube, due to adhesions. And the presence of adhesions whether they have any direct part to play in the aetiology of tubal pregnancy or not, may influence the course of tubal pregnancy when it has occurred. When adhesions are present which are sufficient to prevent contractions of the tube, they may retard ^{early} ~~early~~ abortion, and favor rupture of the tube by the increase of pressure due to blood extravasted into the tube. This is distinctly so in cases where the fimbriae have become adherent and the tube is practically a closed sac, and the pressure of the extravasted blood tends to cause a rupture of the tube at the seat of the placental site, where the wall of the tube is weakened by the action of the trophoblastic cells.

And as these cells cease to act in an active way at about 6 to 8 weeks this applies more particularly to the period up to 8 weeks. We have already mentioned the presence of serous cysts or so called "Pawlick's cysts" as a result of chronic peritonitis and that they are of frequent occurrence, and when large may give rise to errors in diagnosis, and they too may give rise ^{to} symptoms by displacing the parts either in the pelvis or above, and by the pressure and tension which they exert. They are frequently diagnosed before operation as ovarian cysts. The wall is composed of organized exudate bound on to the bowels or other viscera, and naturally, as we would expect, their outline is not so defined as an ordinary ovarian cyst for instance. The adhesions forming, or helping to form, the wall of such a cyst may be thick and quite resemble an ordinary cyst wall till dissected, and they may contain large vessels which may be the source of free haemorrhage if not ligatured. The fluid in these cysts is a highly albuminous serous fluid, yellowish or greenish in color and not viscid. The fact that the fluid is always albuminous is worth noting, as the cysts they may most easily be confounded with at operation viz., parovarian cysts contain practically always a clear non albuminous fluid. Another point about these cysts when they attain any size, is that they are very frequently bound in front by adherent intestine and so on percussion give a resonant note.

As a rule they do not give any acute symptoms being the result of a past inflammation, and they apparently may become absorbed naturally. Targett refers to them as "Perimetritic Cystoma" and the case he recorded, previously mentioned, contained 8 to 10 ounces of fluid.

In cases of rupture of ovarian cysts the fluid may become encapsulated by false membranes and so form a new intra-peritoneal cyst. We know how frequently we get encysted formation as a result of tubercular peritonitis, but this seems to apply more to the upper abdomen than to the pelvis so does not need to be discussed here. In regard to the history of cases where pelvic exudates and adhesions are present, and to whether or not a definite history of inflammatory trouble is always to be obtained. Though such a history is often to be obtained, sometimes we do not get much help from it, and sometimes in cases where from the history, we should expect to find adhesions, none are found at operation. Douglas, cited by Reed, reports 2 cases of ovarian tumour in both of which there were definite inflammatory attacks, and at the operation, as soon as the inflammation had subsided, there were no adhesions found, though it was apparently too soon to expect the adhesions to have been absorbed. Adhesions may be the result of a foetal peritonitis as shown by Ballantyne (Trans. Edin. Obstet. Soc. Vol XV 1890), and some of the results of such foetal adhesions are interesting. Cases of so-called 'double ovary' on one side have been shewn to be due to

division of the ovary into 2 by bands, the result of foetal peritonitis. Ruppolt (Archiv. für Gynäkologie Vol XIVII 1894) recorded a case of constricted fallopian tube due to the same cause. Pozzi mentions in reference to cases of bicornuate uterus that a peritoneal bridle is sometimes found extending from the rectum to bladder above the notch in the fundus, and mentions that this bridle may be a cause of dystocia. And then we cannot always exclude vulvo-vaginitis in the child as a cause of peritoneal infection, which may give rise to no symptoms till the period of puberty. And localized peritonitis accompanying the exanthems., so that we can see that the absence of a history of inflammation does not always mean that there has not been some infection. And we have seen that the peritonitis due to B.C.C. occurs with very little constitutional or local symptoms, and this may give rise to adhesions with tumours. We know that a local adhesive peritonitis does not always give rise to enough symptoms for the patient to lie up. The effusion of lymph does not necessarily cause any temperature or other symptoms as we frequently see in effusion round a gauze drain. But as a rule the absence of pain and the presence of mobility with a tumour means that there are no adhesions, but in a large tumour it is often hard to be sure that immobility is not due to the mere size of the tumour.

In this regard the following case is of interest. G. V. aet 18. Single. Was brought by her mother to the O.F. Department. Had only had 2 periods, 18 months ago. Had noticed gradual enlargement of the abdomen for the last 11 months. The mother wished to know if her daughter were pregnant, as her neighbours had been talking.

On examination the patient was found to be apparently a virgo-intacta, with a large cystic tumour on the left side. There was no pain, and the abdominal wall apparently moved quite freely over the tumour all over. The patient said she had not had the slightest discomfort or pain, and absolutely no history of any inflammatory attack could be obtained, and yet ^{at} the operation an ovarian cyst was found densely adherent to bowel and omentum on its left lateral and posterior walls. Both tubes were apparently normal, and the uterus small and apparently infantile in type.

It has already been mentioned that the blood vessels in adhesions may attain a considerable size, especially when arising from the great omentum or the intestinal canal. Routh (Obstet. Soc. of London. Vol 38) has recorded a case where a fibroid was found free in the abdominal cavity except for adhesions attaching it to the intestinal canal, and through which it apparently obtained its blood supply.

By some authors varicocele of the broad ligament, generally unilateral, is considered to be a cause of pelvic pain, and the presence of inflammatory exudates causing a chronic obstruction to the blood stream is given as one of the causal factors of this condition, but in 2 out of 3 cases I have

seen operated on for this condition, there was absolutely no sign of any such exudate.

The relatively rare condition of hydrops tubae profluens has also been attributed to the action of peritoneal exudates causing occlusion of the fimbriae of the tubes. Orthmann (Monats für Geburtshilfe und Gynäkologie Jan 1903 B.M.J. Feb 28 1903) records a case where omental adhesions had caused complete division of one fallopian tube. Patient had a vaginal oeliotomy in 1895 for a fixed retroflexion, when the right tube and ovary were removed. In 1902 patient had an abdominal hysterectomy done for fibroids. It was then found that the left ~~side~~ tube had been completely divided by a band of omental adhesions. The uterine half was quite closed and also the inner end of the outer piece, while the fimbriae were perfect and the outer part of the ostium was patent.

From the anatomical position of the ~~two~~ ureters we would expect them to be interfered with at times by the presence of inflammatory exudates. Sanger holds that the ureters are more distinctly palpable P. V. in a patient who has had periuterine inflammation, and I have frequently noticed that this is so. Matthews Duncan originally drew ~~the~~ a distinction between a perimetritic and a parametritic inflammation by the fact that in the former albuminuria was less frequent than in the latter - indicating a greater frequency of involvement of the ureter in the latter.

It seems as if their walls were infiltrated by the inflammatory process. The presence of inflammatory exudates may certainly obscure the relations of the ureters in operating, and in some of the cases of ureteral anastomoses recorded lately, this operation has been rendered necessary by the ureters being severed owing to this fact. A case which was operated on by Mr. MacGormick at Prince Alfred Hospital while I was resident there was probably a case of involvement of the ureter in old inflammatory exudates. A young woman who had had the right tube and ovary removed for pyosalpinx had since the operation had several attacks of what were looked on as renal colic, though she had never passed a stone. Under this supposition the right kidney was explored, but no stone was found. On passing a bougie down the ureter some obstruction was met with just below the level of the pelvic brim, and after considerable difficulty the obstruction was overcome and the bougie passed into the bladder. The patient recovered and has since, I have been told, had no further attacks. Here apparently the right ureter had become kinked as a result of the exudates formed after the operation. Another case at which I assisted at the operation gave a history of gonorrhoea 2 years previously, and according to the patient's account she was later on laid up for 6 weeks with peritonitis.

Since then she has had several attacks of renal colic on the right side, during one of which I saw her. She had never passed a stone, nor was there any blood in the urine. On examination the right kidney was distinctly enlarged and tented. P.V. shewed a fixed retroflexion with a hard mass on either side, more marked on the left. When the abdomen was opened, matted appendages on either side were found, with dense adhesions to the posterior pelvic wall. On the right side the ureter could be ~~felt~~^{felt} behind the peritoneum and was distinctly thickened. The adhesions were broken down, both tubes and ovaries removed and the uterus suspended. Since the operation, June 1902, I have seen the patient several times, and she has had no further trouble with the kidney which is at present not enlarged. When adhesions are dense about the neighbourhood of the sacro-s iliac joint some of large veins of the pelvis are very liable to be injured in breaking down the adhesions, and I have seen the internal iliac vein pricked in such a case. Adhesions either artificially produced as in the case of ventrosuspension, or as a result of pelvic peritonitis as between 2 coils of gut, may become pulled out and form strands which may give rise to intestinal strangulation or to internal herniae. Several such cases following a ^{ventro}retro fixation have been recorded (Thomas Amer. Journal of Surgery & Gynaecol. Dec 1900. Hall. Journal of Amer. Med Assoc. 1899. Jacobs Deutsche Med. Wochenschrift 1894)

An interesting case the result of adhesions is recorded by Condamin. B. M. J. Aug 16. 1902. Patient with an ovarian cyst became pregnant. She had no symptoms till after delivery, when she got symptoms pointing to torsion of the pedicle, but was not operated on till 2 weeks after delivery. It was then found that the ovarian tumour had become adherent to the under surface of the liver, and on the uterus being emptied this had dragged down the ovarian cyst, the traction causing interference with the venous and arterial supply of the cyst and hence the symptoms. Adhesions were freed and cyst removed - the patient recovering. Hysterical and neuritic symptoms in women are often put down as being due to some genital lesion, and some authors go so far as to say that when hysteria is habitual and has become a chronic habit it has always a genital basis, and cite cases that have been cured by repair of a cervical laceration &c., In many women and especially in those who have suffered much at the hands of many in the way of operations, we will be hard pressed to account for their symptoms unless we put them down to the presence of adhesions or to hysteria, but it must be recognized that such symptoms must not always be put down to adhesions, and this was forcibly impressed on me by the following case.-

M.
De H. aet 33. Nullipara. Complains of constant dragging pains in both iliac regions, and constant pains burning pains there. Has had 3 abdominal operations since she was 22.

The first for ventrofixation, the second for salpingo-oophorectomy of right side and the third for salpingo-oophorectomy of the left side. Patient was somewhat better after the 3rd operation 5 years ago but this only lasted a few months and since then she has complained of the above symptoms, gradually getting worse. P. V. small atrophic uterus apparently quite free and nil to be felt in the fornices. After being under treatment with various sedatives for some months, I sent her into the Hospital on the supposition that the pains might be due to some bands of adhesions - though nothing could be felt. Dr. Hamilton opened her abdomen, and found absolutely nothing to account for the pains. There were no adhesions and the uterus was in the ordinary small atrophic condition of the post-climacteric. Patient was signed up as "Pelvic neuralgia" and for a few months after the operation she seemed better from the pains, but soon began to complain again. About 6 months ago she contracted a syphilitic chancre on the vulva, and since then she has never complained of the pains at all. Whether the condition will continue or not after she is cured of her syphilis it is hard to say, but meanwhile she says she is ~~quite~~ better as regards pain than she has been for 12 years. As adhesions and inflammatory exudates do so often involve the ovaries and uterus, it is natural that many of the symptoms arising in women who have suffered from pelvic inflammation should be put down to these, and they probably

are very often the causal factor, or by the discomfort they may cause, help to accentuate the neurotic symptoms in such a patient.

Treatment.- Here too we must remember that pelvic peritonitis is essentially a protective process, and tends to limit inflammatory action from the pelvic viscera. Some of the indications for treatment have already been mentioned. First, in regard to prophylaxis in cases of infection of the genital organs. Early treatment with the idea of limiting the infection may prevent the necessity of having to treat the more serious condition in many cases. And in the cases that have already become infected, by assisting Nature to limit the infection by rest, physical and functional, and by treating the general condition of the patient, and recognizing the principle, that except in the presence of very definite indications, early operative interference is as a rule to be deprecated. The great majority of these cases of pelvic exudates tend to clear up of themselves if time is allowed, and especially if the causative factor has been rationally treated, and has ceased to act. But we must remember that a temporary inflammatory lesion may give rise to a chronic peritoneal lesion, as for instance endometritis giving rise to a pelvic peritonitis - the endometritis may be cured but the peritoneal adhesions remain, and this appears especially in the case where the uterus has

been fixed in an abnormal position. We must recognize that when the uterine parenchyma has been the seat of a profound and lasting inflammation, it is unusual not to have evidences of perimetritis - adhesions in Douglas' pouch giving rise to, or maintaining displacement of the uterus, and perisalpingitis and ovaritis interfering with the normal mobility and functions of the tubes and ovaries.

We have seen too, that post-puerperal exudates as a rule tend to be absorbed more certainly than those due to gonorrhoea. It is as a rule impossible to say how long these exudations will take in being absorbed, and whether if they persist they will continue to give rise to symptoms. And then apart from operative treatment there are other means of hastening the absorption of exudates and adhesions.

Massage has never taken a great hold in England English speaking countries, though it has been advocated very strongly by the Norwegians and Germans. Many of the objections to this means of treatment are obvious. When working in Vienna I had some chance of seeing this method of treatment as applied in Dr. Chrobaks' clinic, and of the classes of cases to which it was applied and also some of the results. It has been extensively used there for some years, and their results certainly seem to justify its use.

It is chiefly in those cases in which the symptoms may be taken as being due, to a great extent, to the actual presence of adhesions that it is used e.g., where the causative focus has been treated or has become dormant. It is recognized that those cases due to puerperal infection are the most favorable ones e.g., exactly those cases which we have seen tend to become absorbed themselves if time be given, while cases due to gonorrhoeal infection with constantly recurring attacks, are the class of cases which are not able to stand the treatment in the first place, or if they are, do not seem to be so amenable to it. The first indication is the treatment of the uterine cavity, as being most often the source of the original infection. The first sitting in a massage case should not be more than 10 minutes, and we must be guided to a great extent as to how the patient feels after the first few sittings, as to whether we should go on. Persistence of pain, and especially any rise of temperature, especially during the menses, are taken as indications to desist from treatment. The class of cases in which I saw the treatment applied were chiefly cases of malpositions fixed by adhesions, or to masses of pelvic exudate the result of a past salpingitis binding the ovaries and tubes together. The actual technique need not be discussed described. It is wise as a rule to stop the treatment just before and after the menses, and not to be in too great a hurry to stretch adhesions, but to be content with a

little gain at each sitting. After each sitting hot vaginal douches were used and then ichthyol and glycerine tampons were inserted into the vagina, with the idea of softening the exudations and also helping to maintain any advance in mobility ^(that has been gained. At times too, an ice-bag is) placed over the lower part of the abdomen for some hours. The treatment probably acts by improving the venous and lymphatic circulation in the pelvis, and so hastening the absorption of exudates, while the mechanical manipulation would tend to gradually stretch adhesions.

A considerable number of patients whom I had the chance of examining before, during, and after the treatment gave me a very favorable impression of the method, but I had not the chance of seeing if the cures were permanent, though I was frequently assured that they were. The following case which I have selected from the notes of several cases whom I saw treated may be given.- A. von E. aet 26, 3 para. last child 18 months ago. Difficult labor and was laid up for 5 weeks subsequently. Gives history of constant discharge, menorrhagia, and back and side ache, all dating from the confinement. P. V. Profuse leucorrhoea - perineum good. Uterus enlarged - retroflexed and fixed in that position by bands behind the uterus. Both adnexa low down, tender to palpation and also fixed, somewhat thickened. T. normal.

Diagnosis - endometritis with retroflexion and perimetritis and perisalpingitis. Uterus was curetted and drained with iodoform gauze. At the end of a fortnight the discharge was much better and the patient felt better. Massage at first twice weekly. No reaction. After 3 weeks the uterus was decidedly more moveable and the thickening in the fornices less. At the end of 6 weeks the uterus could be got right forwards, and kept in that position by a pessary. Patient had now lost her back ache entirely. Massage was continued for a fortnight longer. In 3 months she was able to leave the pessary out altogether as the uterus kept forwards. At the end of 8 months Dr. Peham, who kindly sent me copies of the continuation notes of several cases I had seen treated, wrote to say he had just seen the patient, and she had been perfectly well since, and was at the time of writing 2 months pregnant again.

The advocates of massage claim that no harm is done if care is taken, and if it is found that massage is not efficient an operation can always be done later. That it is the surgeons aim to bring about an amelioration of symptoms, and even though an operation may be necessary later, the patients feelings in regard to wishing to avoid one should have some weight.

And also that in cases where the abdomen is opened and adhesions broken down without removing the tubes, often admittedly the causative focus, the treatment is no more rational, and apart from the actual danger of operation, and the possibility of any recrudescence of the focal disease, which applies in both cases, there is the liability for the adhesions to reform on the bared surfaces, even admitted that this danger can be minimized by complete haemostasis and covering the rawed surfaces with peritoneum where possible.

The treatment of these cases, and especially where pain is a predominant feature, by faradic currents is to be regarded as acting on similar lines to massage, and by its advocates it is praised.

Another method which is ^{practised} ~~praised~~ in Chrobot's clinic, chiefly for parametric exudates, but also for the reposition of fixed retroflexions with parametric exudates, is the method of Compression Therapy, by means of a tube containing mercury and with the patient on the inclined plane, generally in combination with the use of a shot bag on the abdominal parietes, just as is used for chronic constipation. Here the action is the same as with massage, and it has been to a great extent superseded by the ordinary massage.

These methods are to be distinguished from those where adhesions were forcibly broken down by manipulation, generally under anaesthesia.

It is generally admitted that this method is distinctly dangerous, and the same applies to Schultze's original method of dealing with fixed retrodisplacements, by dilating the uterus and introducing the finger into the uterine cavity and forcibly replacing it and so breaking down the adhesions.

The importance of adhesions nowadays is much less from an operative point of view than it was comparatively few years ago. Formerly universal adhesions were considered as an absolute contraindication to operation, but not so now, and I have seen several cases operated on successfully which had been opened some years back and the case deemed inoperable on account of universal adhesions. Certainly adhesions are even now the bug bear of the abdominal surgeon, and probably more so in the pelvis than in the upper abdomen. Howard Marsh (B. M. J. Jan 1899) reports the following case, illustrating the above.- A patient with periuterine inflammation was opened, but the adhesions were found to be ^{so} dense that it was considered inadvisable to proceed further, so the abdomen was closed. 2 years later the abdomen was opened again, when the adhesions were entirely gone. This illustrates the fact too, that the densest adhesions may be absorbed if time is allowed. That the pain, which is as a rule the chief symptom of adhesions, may be relieved by simply freeing the adhesions is well illustrated by the following case recorded by

Haig Ferguson. (Journal of Obstetrics & Gynaecology of British Empire April 1903.) Patient complained of constant pain in both iliac regions, the result of old inflammatory trouble giving rise to adhesions. On operating he had freed the adhesions on one side, when, owing to stoppage of respiration, he was obliged to close the abdomen without touching the other side. The patient was quite cured of the pain on the side the adhesions had been freed on, while it persisted just as before on the other. I have mentioned how the presence of adhesions gives rise to trouble by ^{obscuring} ~~obscuring~~ and altering the normal relations of the parts ~~the~~ and the dangers of wounding or cutting across the ureters, of cutting into the bowel or bladder, or wounding one of the large pelvic veins especially in the region of the sacroiliac synchondroses, all of which accidents I have seen happen and none of which are likely to happen unless the normal relations are obscured. As a rule adhesions can be broken down comparatively easily and a plane of cleavage found along which the adherent organs can be separated, but probably the most difficult cases are those where there is ^{the} ~~a~~ ~~most~~ solid plaque like condition of cartilaginous consistency which has been mentioned in dealing with tubercular infections. As a rule not many of the torn adhesions will require ligature, and the bleeding stops itself, or yields to heat pressure.

When the adhesions are so firm that they do not tear easily, it is better to leave a piece of adhesion adherent to the bowel, for instance, than to run the risk of tearing the bowel. It has been mentioned that it is possible to minimize reformation of adhesions after operation, and here several factors may be alluded to. Avoid handling bowel as much as possible, by keeping it out of the field of operation by the use of flat sponges or the Trendelenberg position, by gentle manipulation and the avoidance of rough sponging. Use normal salt solution and not irritative antiseptics, as these by themselves may cause effusion of lymph. Where denudation of peritoneum is necessary try and cover such denuded surface by flaps of peritoneum after ensuring complete haemostasis. By the use of absorbable ligatures and the top sewing of cut surfaces in preference to the bunching that was inevitable with a large pedicle, as was formerly done in salpingo-oophorectomy. And lastly but not least, the observance of the strictest aseptic precautions.

Jessett (Journal of Obstetrics of British Empire Vol 11 No 5) in reviewing the causes of trouble after coeliotomy, where the comfort and perhaps the life of the patient are endangered, gives as the commonest cause of such trouble the presence of adhesions, which he says may be due to 1 mild sepsis 2. undue handling of the guts, 3. improper burying of stumps, 4. leaving clots of blood in the peritoneal cavity,

5, failure to bring down the great omentum at the end of the operation. We might add to these the use of unabsorbable ligatures and the use of drainage, though we have mentioned how completely the effusion round a drain may become absorbed. But it is frequently in these cases where drainage - nowadays mostly gauze, has been used, where the peritoneum is so seriously damaged and where extensive raw surfaces are of necessity left, that the peritoneum is unable to absorb the protective exudate that is formed, and which therefore becomes organized.

The principal indication for repeated laparotomy is pain, due most often to the presence of adhesions, and this pain may be local or generalized. But the result of repeated operation is not satisfactory because as a rule after breaking down the adhesions it is not possible to cover the raw surfaces with peritoneum. One method, which has been extensively tried for the purpose of preventing the raw surfaces from becoming re-adherent, is the dusting of the denuded surfaces with aristol or some other sterilized bland powder, but here too the results have been unsatisfactory. The latest method proposed is the use of sterilized animal membrane, using sheets of ex peritoneum subjected to heat-cumol sterilization, It is called Cargile membrane. Robert E. Morris (Medical Record May 17 1902) records a case where this membrane was used for extensive recurrent adhesions in a patient whose abdomen had previously

been opened and adhesions broken down and the surface dusted with aristol. But the symptoms persisted after the first operation, and so it was decided to try the Cargile membrane. Morris reports that after breaking down the adhesions and applying the membrane the relief from pain was immediate. This is the only case I have been able to find in the literature so far. Experiments made on rabbits shew that the membrane is absorbed in from 10 to 30 days, and that it causes but slight constitutional disturbance and very little peritoneal reaction. There must be some peritoneal reaction but the great advantage is that the raw surfaces are kept apart until the endothelial cells have repaired the injury. It is not necessary to use sutures as the membrane becomes adherent at once to a moist surface, and, it is claimed, is not dislodged afterwards. It may be compared to the use of protective tissue after skin grafting. If it should prove of value it ought to fill a distinct want in abdominal surgery, and would be of use too for such a purpose as preventing the raw edges, after the formation of an artificial ostium in the tube, from becoming adherent. But unless we can be perfectly sure that the membrane is sterile, a difficult matter with any animal tissue, it would seem to be rather a risky procedure to leave a foreign body in what must be a damaged peritoneal cavity, where as we have seen the absorptive power is impaired.

In cases of pelvic inflammation where after the removal of the infecting focus, as for instance the tubes and ovaries, the pain still persists, as a rule it may be looked on as being due to adhesions. In such cases the most that can be said is that ~~that~~ the source of danger has been removed and that the symptoms will probably be ameliorated as time goes on. This raises the question of whether in the operative treatment of inflammatory cases after removing both tubes and ovaries the uterus should be left - the argument being that by removing it we can much better cover all raw surfaces with peritoneal flaps, and thus avoid the chance of further adhesion formation round what is now a useless organ, and further than that, an organ liable to be the source of further infection. There are several points in favor of this argument, but probably more against it. That such infection can apparently thus take place is illustrated in the following case which I have under my care at the Out-patient Department. M. S. aet 43. 7 para. Had double salpingo-oophorectomy for post puerperal infection in 1894. She had a second section in 1895 for adhesions drawing the uterus to the right and causing constant pain, which was not relieved by operation. In 1897 the abdomen was again opened and the adhesions broken down on this occasion aristol being used to dust over the raw surfaces. Six weeks after this operation, as a purulent vaginal discharge still continued,

the uterus was curetted and immediately after this the patient had a rise of temperature to 103 to 104 degrees lasting for some weeks, but this gradually subsided. When I first saw the patient in 1902 she complained of constant pain, with exacerbations in the right iliac region, with constant constipation and occasional attacks of vomiting. On examination there was tenderness on deep palpation all over the right iliac region. P.V. uterus found to be small and drawn over to the right by dense bands of adhesions. On looking through her old notes I could find no reference to whether or not her vermiform appendix had been removed, and so under the supposition that part of her trouble might be due to the involvement of her appendix, I advised her to go into the Hospital and be explored again. In April 1903 the abdomen was opened and the condition as below found. The right lateral surface of the small uterus was the lower focus of the adhesions which were very dense, and the caput caecum coli the upper. On searching for the appendix it was found to be absent, and had apparently been removed at one of the previous operations, though no note had been made of the fact at the time. The adhesions were freed above, and the raw surface over-stitched by doubling over the distended caput caecum coli. A supra-vaginal amputation of the small uterus was done, after which the pelvic floor was covered over with peritoneum mostly from the bladder aspect, so that when this was finished

there was practically no rawed surface left below. The wound healed per primam. I have seen the patient frequently since, and she has quite lost her pain and feels, as she says, another woman. In this case the original infection had been a post puerperal one, and the fresh infection, as shewn by the temperature &c., had either been due to the stirring up of organisms in the endometrium or due to a fresh infection at the time of the operation. Whatever the cause, the adhesions at the last operation were very dense and quite accounted for her symptoms. This case is of interest too in comparing the ultimate result with the case previously mentioned on page 59.

