an operation which has a most important field of usefulness. If the pelvis is small and the head seems to be riding high, or if a woman habitually has larger children than can safely be born, it is proper carefully to watch the patient during the last two months of gestation and to terminate pregnancy at any time when the child's head seems, relatively to the pelvis, a close fit. Once a week the patient should be examined, and by the bimanual method the ratio between the size of the head and the diameter of the pelvis carefully estimated. There will be a certain proportion of disappointments, but what might be otherwise fatal dystocia will be avoided, and in many cases a healthy child secured.

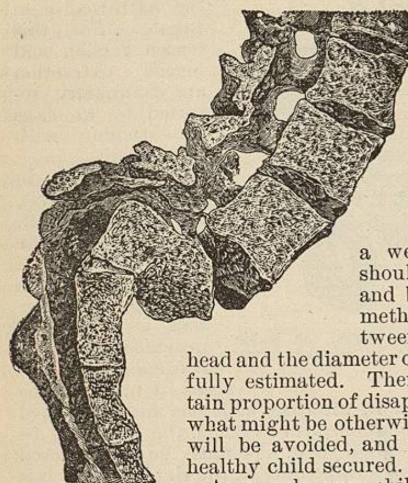

Fig. 3767.—Spondylolisthesis. (Neugebauer.)

As a rule any child of over eight months' gestation will do well with proper care, and sometimes one even younger will thrive. The success depends on the judgment of the physician, who should allow to the infant every week of intra-uterine life that is possible. An error either way is bad. If the operation is delayed too long, the premature infant will resist very poorly the manipulation necessary for an operative delivery. If labor is induced too early, the child is robbed of just so much vitality.

The operation of *symphyseotomy* has lost favor in the last few years because of the risk of infecting the mother, or of leaving her permanently crippled from failure of union of the symphysis, and because of its uncertain results as compared with the good results of a properly performed Cæsarean section. It must be restricted to cases in which the possible separation of the pubic bones of 7.5 cm. will enlarge the pelvic canal sufficiently to allow the head to pass. It is of no value in those cases in which the sacro-iliac synchondroses are ankylosed. The tedious convalescence of the mother is a serious matter.

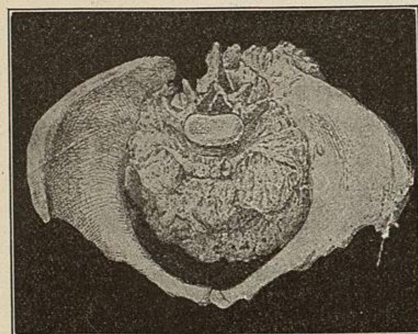

Fig. 3768.—Enchondroma of the Sacrum of such a size as to Diminish very greatly the Capacity of the Pelvic Cavity. (Behm.)

Compared with the Cæsarean section, it is the more dangerous, more uncertain of the two, and of greatly restricted range of application.

The *Cæsarean section* must be employed in those cases in which there is no other possible method of delivery of the child, living or dead (the absolute indication), or it may be employed (the relative indication) in cases in which delivery of a living child is possible only by laparotomy. The indication has been extended, by some, even to those cases in which delivery of a living child is improbable except by laparotomy.

This operation in properly experienced hands seems to promise great usefulness. Every year the indications for this operation are enlarged. Whereas a few years ago, on account of the great mortality of the Cæsarean section, only the absolute indication for the operation was considered valid, now, granted good surgical facilities, the question of a conservative laparotomy in the interest of both mother and child may be decided in the affirmative in cases of obstructed labor. If the deformity is so great that a successful induction of premature labor in a later pregnancy is improbable, the uterus should be removed at the time of operation.

The mutilating operation on the child, commonly known as *craniotomy*, is indicated where the obstruction is absolute and the child dead, or where the condition of the mother, or the lack of facilities for operating, prohibits surgical interference. The crushing followed by traction on the head is usually sufficient to effect delivery without much additional shock. Rarely, if the child is of large size, evisceration or further mutilation of the child must be resorted to. *Franklin A. Dorman.*

PELVIC CELLULITIS.—Definition.—Pelvic cellulitis is an inflammation of the pelvic cellular tissue which may or may not go on to abscess formation. The same condition is also described sometimes as parametritis, perimetritis, pelvic abscess, etc.

Anatomy.—Before describing pelvic cellulitis, a few words as to the anatomy of the pelvis will be necessary. Rosthorn defines the functions of the pelvic cellular tissue as follows: 1. It serves as a material to fill in empty spaces between the organs. 2. It serves to connect the peritoneum to the underlying organs. 3. It serves as a sheath for the blood and lymphatic vessels. 4. It serves as ligaments, holding the various organs one to the other and to the surrounding bony structures. We can see, therefore, that the connective tissue is freely distributed through the pelvis and forms the loose framework in which lie the organs. The denseness of this tissue varies according to its function and position. In places there is a distinct thickening, forming, if we may call it so, a species of curtain, which divides one portion of the pelvis from another and tends to localize infection to one part of the pelvis, though when an abscess forms it may be easily imagined as breaking through the septa. These septa or curtains are difficult to demonstrate by dissection, and the most striking way of showing their relations is by the injection of material which will harden *in situ*. By this method three main regions are found to occupy each side of the pelvis. (1) The anterior region comprises the cellular tissue around the bladder and that lying anterior to the cervix, there being a connection between these regions on the two sides through the cellular tissue binding the posterior surfaces of the bladder to the anterior portion of the cervix and uterus. (2) The next region is bounded anteriorly by the above-described partition, posteriorly by a second curtain which extends from the uterus outward along the infundibulo-pelvic ligament, giving to this area a rough triangular shape with the base directed toward the pelvic wall and the apex toward the uterus, and including practically all of the connective tissue lying in the fold of the broad ligament and continuous with the cellular tissue filling the iliac fossa. (3) The third, or posterior area, surrounds the rectum and is continuous with the cellular tissue of the retroperitoneal area.

Besides these three main divisions, anatomists describe several less well-marked areas where an infection may be localized.

Etiology.—Infection of the cellular tissue is always due to the attack of one of the pathogenic bacteria, and, according to whether the bacteria gain entrance directly to the cellular tissue through a wound or by lymphatic infection, or whether the infection follows by direct extension from inflammation of the tube or other pelvic structures, we divide the cellulitis into the primary and the secondary forms.

In the primary forms the cellular tissue is invaded directly by the disease-producing bacteria, generally through a tear or wound in the cervix or uterus, or by direct lymphatic extension.

In the secondary form the seat of infection primarily is the tube, ovary, bladder wall, or rectum, the cellular tissue being invaded by contiguity. The primary cellulitis is the rarer of the two, and for some years its possible occurrence was denied.

Wounds of the cervix are not frequent in any condition save that of childbirth, and this is by far the most frequent etiological factor in primary cellulitis, the bacteria being introduced by the unclean finger and advancing directly into the tissues. In an occasional case the infection also results from a wound of the cervix from careless dilatation, or from the use of the uterine sound or other instrument in such a manner as to cause a puncture through the vaginal wall of the cervix or the uterine wall.

Secondary cellulitis of some part of the pelvic tissue accompanies almost every case of distinct inflammation in any of the pelvic organs. Most frequently the condition follows salpingitis or pyosalpinx, the tube being the most frequent site of inflammation in the female pelvis.

Morbid Anatomy.—The pathological picture presented in this disease varies according to the type and the degree of virulence of the infecting organism. Most of the cases of primary cellulitis are due to invasion of the tissue by the streptococcus, and naturally the picture of a virulent infection is given. If the tissues be examined early enough all that will be noticed is a brawny infiltration of the loose tissue, which on minute examination is found to be due to a rapid proliferation of round cells and to the effusion into the tissues of serum and leucocytes. Later, we find distinct small abscesses scattered through the tissues, the size of the abscesses varying from the point to the head of a pin. Still later, if the infection continues and the patient lives, we find that the numerous small abscesses have become conglomerate, and that a distinct abscess has been formed. Not infrequently, however, an abscess does not form, but, instead, the tissues appear to gain a certain amount of resistance against further breaking down, and in place of the conglomerate abscess a slow absorption of the minute abscesses present and a gradual healing take place. In the secondary infections we are less apt to find abscess formation, especially if the infection is due to a not extremely virulent species of micro-organism (the gonococcus, for example). Naturally, when the tubal or ovarian disease is due to infection by the more virulent organisms, we find more frequent abscess formation, generally in the folds of the broad ligament. As already stated, in the primary forms the streptococcus, either alone or in company with one or more of the other organisms, is the cause of infection. In the secondary cellulitis the gonococcus, the staphylococcus pyogenes albus and aureus, the typhoid bacillus (rarely), the proteus and certain other rarer forms, have been isolated from the tube or ovary and evidently would be found in the focus of secondary infection.

Symptomatology.—*Primary Cellulitis.*—In this form the symptoms are usually quite well marked. Generally three or four days after a labor in which careful asepsis has not been observed, or in which there has been much handling, the patient will have a distinct chill, the temperature rising to 102° or 103° F. She will complain of general malaise, violent headache, possibly nausea, and of acute pain in the lower abdomen, generally located in one side or the other. On examining such a patient the lower abdomen will be found somewhat full, and palpation will be impossible from the amount of muscular spasm present. In making a vaginal examination a sense of resistance will be found at the base of one of the broad ligaments, the uterus will also be found to be somewhat more mobile than it should be, and the patient will complain of extreme pain when we attempt to move the uterus or make pressure upon the lateral fornices. After a day or two a distinct induration will be felt through the vagina, and on bimanual palpation a moderately-sized mass will be felt lying in the broad ligament; in some cases this indurated mass can be easily felt above Poupart's ligament as a dense hard tumor.

Secondary Cellulitis.—The symptoms of this form are commonly masked by the primary disease, and it is practically always the primary disease that we are called upon to treat, for, unless an abscess of the cellular tissue be present, the curing or the removal of the primary point of infection will be followed by a slow amelioration or disappearance of the cellular inflammation.

Diagnosis.—The diagnosis of the primary form is based partly on a study of the symptoms, but chiefly on the results of the abdominal, the vaginal, and the bimanual examinations. For if we find on abdominal examination an indurated mass extending up along the anterior abdominal wall; if on vaginal examination the lateral fornix of the same side is found to be hard, dense, and brawny, or possibly depressed toward the outlet; and if on bimanual examination we can outline a distinct mass between our hands, separate from the uterus or enclosing the uterus in its outlines, we may feel reasonably sure that whatever else is present we have an inflammation and probably an abscess in the pelvic cellular tissue.

The diagnosis of the secondary form is not of so much importance if the diagnosis of the primary focus be made, as we may be sure that with pyosalpinx, ovarian abscess, or any collection of pus in the peritoneum, there will be more or less involvement of the contiguous cellular tissue.

Treatment.—*Primary Cellulitis.*—In this affection we must be governed by the inflexible surgical rule that, if pus be present, it must be evacuated by the shortest available route, and it only remains for us to decide which would be the shortest route for its evacuation. In many cases it is difficult to be absolutely certain as to whether pus is present or whether the tissues are merely densely infiltrated, and fortunately this need not greatly bother us, as the best results are gotten by breaking down and draining such an exudation. Hence in every case of primary cellulitis, whether the exudation has broken down and pus has formed, or whether merely a dense indurated mass is present, the indication is clearly to provide effective drainage.

There are two paths by which we may get at such a mass and drain it: first, through a vaginal incision; second, through an abdominal incision. The best drainage is undoubtedly gotten through the vagina, as it is the most dependent part, and this avenue of attack is selected in those cases in which the abscess or the indurated mass is distinctly palpable through the vaginal vault, or in which the abscess is distinctly pointing in this direction. The abdominal route is selected in the cases in which it may be difficult or dangerous to make the vaginal puncture, or when the mass is distinctly pointing above Poupart's ligament. To make the vaginal puncture the patient, after being anæsthetized and after the vagina and surrounding parts have been made surgically clean, is brought to the edge of the table with the buttocks protruding slightly over it and the thighs flexed on the abdomen, where they are held by an assistant or by one of the many leg-holders. A final careful examination is then made to outline again the pelvic mass. A Simon's speculum is introduced into the vagina, the posterior lip of the cervix is grasped with the tenaculum, and the posterior vaginal fornix put on the stretch. Then with the knife or scissors a little incision is made in the vaginal vault through the vaginal mucous membrane just back of the cervix. The speculum then having been withdrawn, the forefinger of the left hand should be introduced into the rectum, and the thumb of the same hand into the vagina, the tip of the thumb resting against the incision made in the vaginal vault. Then a sharp-pointed pair of scissors should be carried into the vagina, and under the guidance of the thumb the pointed end of the closed scissors should be placed in the small incision in the vault and at the proper moment plunged boldly into the pelvic mass. The presence of the forefinger in the rectum serves not only to indicate

the exact position of this organ, but also to guard it against possible damage. If an abscess be punctured by this manœuvre, there will be a gush of pus into the vagina and the scissors can be withdrawn. Then the opening into the abscess may be widened by careful cutting or by tearing with a pair of Goodell dilators, and after this the cavity should be explored with the finger to estimate its size and position, and to make sure that no more unopened abscesses remain behind. If no pus follows the puncture by the scissors this instrument is to be withdrawn and the finger is to be carried into the track of the puncture. By this manœuvre one may oftentimes succeed in finding an abscess which was not opened by the scissors. If no abscess be present the brawny indurated tissues are broken down with the finger so that a moderately large cavity remains where the indurated mass was before. The opening into this cavity must also be widely dilated so as to prevent undue narrowing before complete healing has taken place. Then either the abscess or the artificially made hole in the indurated tissues is to be firmly packed with iodoform or subiodide of bismuth gauze, and this gauze is allowed to remain in place for some days unless untoward symptoms appear. After the lapse of five or six days the gauze is slowly removed, a little bit being taken out each day until the whole shall have been removed. In some cases it may be necessary after this to pack again.

If the path through the abdomen is chosen, the abscess or the mass of indurated tissue must be reached and drained in precisely the same manner as would be adopted in the case of any other collection of pus in the abdominal cavity. The incision is generally made parallel to and just above Poupart's ligament, care being taken to avoid the deep epigastric artery which runs directly under the incision. When the abscess is reached the pus escapes through the opening thus established. Then either a glass or a rubber drainage tube should be carried down to the bottom and gauze packed around it. On the other hand, if simply a mass of indurated tissues is found, then this is to be broken down in the same way as through the vaginal incision.

In some cases it is desirable to combine the two methods of procedure; that is to say, we may establish drainage both through the vagina and through the abdomen. Such double drainage is usually followed by a more rapid healing of the abscess cavity, but it leaves an unsightly scar on the abdominal wall, and the sinus will sometimes remain open for some months before final healing takes place.

The treatment of the *secondary cellulitis* resolves itself into the treatment of the associated primary condition, and needs no special notice.

PROGNOSIS.—The prognosis of pelvic cellulitis will necessarily vary according to the virulence of the infecting organism. In any event, however, the prognosis, in a case of the primary form, must always be very guarded, as the patient may linger along for weeks and finally die of exhaustion even though the abscess has been thoroughly opened and apparently good drainage obtained. At the same time, if the patient survives the formation of an abscess, we may rightly expect that the free incision and the establishment of drainage, in combination with careful general treatment, will be followed by a final recovery.

Otto G. Ramsay.

PELVIC PERITONITIS.—DEFINITION.—Pelvic peritonitis is an inflammation of the visceral or parietal pelvic peritoneum, and either remains confined to this portion or extends upward into the general peritoneal cavity. Pelvic peritonitis should not properly be described as a separate and distinct disease, for it is due to the same causes as those which excite an inflammation of the general peritoneal cavity, and the effects which are produced are also essentially the same. Because, however, of the situation and peculiar anatomical relations, inflammation here is much more commonly localized than is inflammation in other parts of the peritoneum, and for this reason we are justified in describing it separately.

SYNONYMS.—(Pelveo-peritonitis; parametritis; perisalpingitis, etc.)

VARIETIES.—There are three varieties of pelvic peritonitis, viz., (1) acute or fresh pelvic peritonitis, (2) chronic exudative peritonitis, and (3) chronic adhesive peritonitis. Except in those cases in which there is tuberculous disease, we rarely see the chronic form except as the outcome of a preceding acute inflammation. The converse is not necessarily true, viz., that the acute form of inflammation is always followed by chronic manifestations; at the same time it is not common to have an acute pelvic peritonitis clear up entirely without leaving some few slight adhesions, or a certain amount of roughening and thickening of the pelvic peritoneum.

ETIOLOGY.—Acute pelvic peritonitis is always the result of bacterial infection, and practically always secondary to some acute inflammation elsewhere, as in the tube, the ovary, the uterus, the bladder, or the rectum; or possibly it may develop from an appendicitis.

The most frequent causative micro-organism is undoubtedly the gonococcus, which, so far as danger to life is concerned, may rightly be considered the least malignant. The streptococcus pyogenes is another organism which causes pelvic peritonitis. Owing to its greater malignancy, however, this micro-organism gives rise to an inflammation which rarely remains localized in the lesser cavity, but extends upward to the general peritoneum. Pelvic peritonitis has also sometimes been due to the presence of the staphylococci, of the colon bacilli, or of some of the micro-organisms which in exceptional cases play a part in exciting tubal inflammation. As other possible sources of infection may be mentioned an ovarian abscess, or a focus of infection located in the cellular tissue or in the network of lymphatic vessels.

MORBID ANATOMY.—The reaction of the pelvic peritoneum to irritation is exactly the same as that which takes place in any serous membrane. The only features to which, in the limited amount of space at my command, I need to call attention, are the following: There is a decided tendency, in an inflammation of this character, to the throwing out of plastic lymph upon the free peritoneal surface, and, at the points where this occurs, adhesion between the contiguous parts is almost sure to follow. In a few cases, however, the exuded lymph may undergo absorption, and the affected serous surfaces may eventually return to a normal state. In the majority of instances the pelvic peritonitis, after the subsidence of the more acute manifestations, assumes the characteristics of either a chronic exudative or a chronic adhesive peritonitis. The chronic exudative form is characterized by the exudation of serous fluid, which, as a rule, is found in a sort of cul-de-sac that is walled off from the general cavity by a roof of adherent intestines. This sac, in the early stages, contains a clear serous fluid, but sooner or later this fluid becomes purulent in character, by reason of the wandering in of leucocytes. In the chronic adhesive form, instead of a serous exudation, there is thrown out, as already stated, a more plastic lymph which glues together all the pelvic structures. This is the form of the disease which is most frequently observed and in which the adhesions may be so numerous that the tube, ovaries, and uterus are bound together in one indistinguishable mass.

SYMPTOMS.—Acute peritonitis gives rise to well-marked symptoms. The patient complains of acute pain localized in the lower abdomen, and with the pain there is a distinct rigidity of the lower portion of the abdomen and probably some abdominal distention. The temperature is found elevated, sometimes reaching 103° or 104° F.; the pulse is rapid; and there may be nausea with vomiting. On examining such a patient we are almost sure to find that acute tenderness is present over the lower abdominal zone; and a vaginal examination, although it may fail to reveal anything very distinctive, is sure to cause acute pain when pressure is made on the fornices, or when any attempt is made to move the uterus. The patient, it will also be noticed, lies perfectly quiet on her back with the legs drawn up, as any movement causes greatly increased pain. Generally, after the lapse of three to four days, the symptoms decrease in severity, the abdominal distention and muscle spasm disappear, and the temperature falls. In those cases in which the disease assumes a chronic character it is astonishing to note in how many instances the severity of the symptoms is out of all proportion to the small extent and slight degree of chronic inflammation present. These patients, as a rule, complain of much menstrual distress; backache is very common, and pain is often complained of in one or the other ovarian region. These patients are also apt to complain of headache or of some form of nervous, gastric, or intestinal disorder.

The chronic exudative form of peritonitis is characterized by the presence of an exudate, and with this may be associated the symptoms of a pelvic abscess. In cases of the latter nature acute local pain is present in the earlier stages; there are also decided abdominal tenderness, rapid pulse, and fever, and yet it is to be noted that, in the later stages, fever is not necessarily present. We find on local examination a fluctuating mass which pushes the uterus forward and which is very tender on pressure. It will also be observed that the more dense and indurated the walls of this mass are, the more apt are we to find a collection of pus rather than one of serum.

DIAGNOSIS.—The diagnosis of an acute pelvic peritonitis is not difficult, and is based on the acute pain, the spasm of the muscles, the rise of temperature, and the local findings. In the chronic form which is characterized by adhesive inflammation, the diagnosis rests on the lessened mobility of the organs, on their abnormal positions, and on the fact that we can actually feel the presence of more or less distinct bands of adhesions.

In the chronic form which is characterized by the presence of an exudation, the differential diagnosis may have to be made between it and a pelvic hæmatocele. This, however, is usually an easy matter, as the histories of the two affections are very different, and besides, on examination, we can satisfy ourselves, in the case of the hæmatocele, that we are handling a solid tumor, which often, under the pressure of the finger, yields a crackling sensation, owing to the breaking down of the clot.

TREATMENT.—In the treatment of acute pelvic peritonitis two very important objects should be kept in view: First, that life may be saved; and second, that the local changes resulting from the disease may be diminished as much as possible both as regards their extent and as regards the seriousness of their character. The therapeutic measures to be adopted must vary according to the nature of the infection. Inasmuch as most of the cases of acute pelvic peritonitis are gonorrhœal in origin, this fact will be one of the first to be thought of when the questions of etiology and prognosis are taken up for consideration. In these cases, as a rule, life is not in extreme danger, because the tendency of gonorrhœal peritonitis is to remain localized in the pelvic cavity.

A patient who is suffering with an attack of this character should be put to bed and advised to remain as quietly as possible on her back. The object of this advice is to prevent any sudden movement which might cause a breaking down of adhesions between the end of the tube and the surrounding structures, and so prevent the outflow of bacteria-containing secretion from the freshly opened end. The inflammation is also to be combated by the free use of salines such as Rochelle salts, or by frequently repeated doses of Carlsbad salts. The pain may be relieved by the use of hot moist applications, or, if the attack is seen in the very early stage, cold applications may give more relief, and may possibly abort the attack. Opiates are dangerous remedies, and are not to be used unless the pain becomes extreme, in which case good results may be obtained by the use of suppositories containing extract of opium and extract of belladonna. Hot vaginal douches are also of value, if they can be given without causing the patient great discomfort. The patient should be put upon an extremely light bland diet, and she should also be allowed the free use of liquids. Such a patient should be kept quietly in bed for at least a week after all acute symptoms have disappeared. This precaution will be found to be a great help in preventing a recurrence of inflammation.

Operative interference, during an acute attack, is indicated only when the symptoms are somewhat urgent. The abdominal cavity should then be opened from above, in the usual manner, and free drainage established, or an opening may be made into the cul-de-sac from below, by way of the vagina.

In chronic exudative pelvic peritonitis, the exudate lies in the cul-de-sac, and can be most easily reached through the posterior vaginal fornix, as it generally points most distinctly in this locality. Before the operation is begun, the vulval area and the vagina should be thoroughly scrubbed and disinfected. The patient's legs being flexed on the abdomen and held in this position by a leg-holder or by assistants, the surgeon should introduce the forefinger of the left hand into the rectum, and the thumb into the vagina, the tip of the latter being kept pressed against the fluctuating swelling in the cul-de-sac. Then the pointed end of a closed pair of sharp-pointed scissors should be plunged into the mass under the guidance of the thumb, the forefinger in the rectum acting both as a guide and as a means of preventing puncture of the rectum. The insertion of the sharp-pointed instrument into the cavity is followed by a gush of clear or purulent fluid. The blades of the scissors are separated and withdrawn from the cavity, and the opening thus established should then be made still larger by stretching and tearing its sides with the Goodell dilator. Finally, the cavity should be washed out and packed with gauze, and the latter should be allowed to remain in for five or six days or even longer unless there be symptoms indicating that it should be removed sooner.

In the treatment of chronic adhesive peritonitis the use of frequent hot douches, in conjunction with the application of the tincture of iodine to the fornices, and with the introduction of cotton or lambs' wool tampons soaked in glycerin, often proves very helpful. Besides these local measures pelvic massage, regular exercise, and a general tonic treatment will sometimes be followed by an apparent cure, though such patients are very apt to have a recurrence of the disease after any imprudence.

The question whether an operation should be advised, or whether better results may not be obtained from the employment of the palliative methods of treatment, is always difficult to answer; the proper answer will depend on circumstances. In the first place, it must be remembered that the operation is always attended with a certain amount of danger, and that this danger must be incurred not for the saving of life, but simply for the relief of symptoms. On the other hand, if the patient has to work for her living, the surgeon cannot rightly refuse to place her under the best possible conditions for successful work. For this reason he is scarcely justified in advising a patient whose family is dependent on her exertions for their support, to undergo the long-continued applications, etc., which are required under the palliative method of treatment. On the other hand, in the case of a woman who can command everything necessary, palliative measures may be followed by splendid results.

On the whole, the results of operations in the pelvic cavity have thus far been very satisfactory.

Prognosis.—The prognosis of acute pelvic peritonitis, so far as life is concerned, is generally good, but caution should always be observed in promising a complete return to normal health.

In the chronic exudative pelvic peritonitis, the prognosis, after the cavity has been opened and drained, is fairly good. In most cases the patient will regain health, and, if the tubes have not been completely destroyed, she may in course of time bear children. In the adhesive form a complete cure must not often be looked for as the result of simple palliative treatment; and even when an operation is resorted to, the degree of completeness of the cure will depend on the condition of the pelvic structures.

Ot' G. Ramsay.