

by feeling with the abdominal hand the fundus uteri in its normal position and by the passage of a sound.

Treatment.—Operative treatment is usually demanded in a case of myoma. Palliative measures are of little value, and are indicated only where serious degenerative changes in the heart, lungs, or kidneys preclude the possibility of surgical interference. Operation is indicated because of the danger of the accidents possible to myoma, viz., inflammation and infection, malignant degeneration, etc., and because of the very faint hope of spontaneous cure and atrophy of the growth following the menopause. Should the patient be a young woman with a small tumor, and desirous of maternity, the expectant treatment is justifiable. The patient should be warned that the tumor may interfere seriously with labor, may cause her to abort, and may grow with great rapidity during pregnancy. On the other hand, there is a possibility that the tumor may disappear after labor. Should the tumor be intraligamentous and of pelvic growth, expectant treatment is not justifiable, as dangerous pressure symptoms may result and labor be certainly obstructed should pregnancy occur. In the case of a woman who has reached the menopause, in whom menstruation has ceased, and who suffers from no serious symptoms, expectant treatment may be tried in the hope that the disease may become quiescent.

Among palliative measures may be mentioned the exhibition of drugs, electricity, and various palliative operations. Drugs have no effect upon the growth of the tumor. Ergot perhaps does good in arresting hemorrhage in some cases, but is of no other value. Electrolysis has been practised by Martin, Engelmann, Keith, and others, but it does no good; and, on the other hand, it may do positive harm by setting up inflammatory adhesions, thus rendering the subsequent operation more difficult.

Thorough curettage of the uterine cavity, by removing the hemorrhagic and chronically inflamed endometrium, is a very efficient means of checking hemorrhage. The bleeding is usually much diminished for several months after this procedure, though recurrence of the symptom almost invariably occurs. Curettage, which may be expected to check hemorrhage and to remove polypi, is indicated in all those cases in which the physical condition of the patient does not warrant more radical measures.

Ligation of the uterine arteries and broad ligaments to shut off the blood supply of the uterus and thus to cause atrophy of the tumor, has been practised. While this operation seems to have done good in some reported cases, it is now used only as a rare palliative measure. Salpingo-oophorectomy has been of value in many cases. Its dangers are as great as those of hysterectomy, and at the same time it does not remove the disease. It is not available in all varieties of myomata, and is of no value after the menopause.

Of the radical operations salpingo-oophoro-hysteromyomectomy is the operation of choice in the great majority of cases. The operation is indicated in the presence of large adherent tumors, when radical measures are necessary, and where degenerative or inflammatory changes are present in the ovaries or Fallopian tubes.

Myomectomy is the least mutilating of the radical operations. Its advantages are the possibility of pregnancy after operation and the avoidance of the surgical menopause. Its dangers are the liability to recurrence of the tumor and the frequency of post-operative hemorrhage. It is also applicable only to isolated pedunculated tumors and some few isolated sessile, interstitial, or broad-ligament growths so situated that they may be easily shelled out without undue injury or loss of tissue. This operation, which preserves the uterus, tubes, and ovaries intact, is the most conservative operation in the treatment of myoma of the uterus.

Further conservative measures are hysteromyomectomy, an operation which leaves the ovaries and tubes intact wherever possible, and a hysteromyomectomy with high amputation of the cervix. This latter pro-

cedure is of greatest value in those cases in which total hysterectomy is not necessary and myomectomy is impossible. The tubes and ovaries are left intact, and the uterus is amputated at the highest possible point, so that a portion of the uterine body, lined with corporeal endometrium, even though it be small in amount, may be left in the stump.

ADENO-MYOMATA are rare forms of uterine myomata containing glandular elements. The epithelial structures are derived either from the endometrium or from the remains of the Wolffian body. In those developing from the endometrium the tumors are situated in the anterior, posterior, or lateral uterine wall, and have the usual characteristics of myomata, except for the presence of glandular elements and the absence of capsule. Those derived from the remains of the Wolffian body are found on the posterior surface of a uterine cornu, in the tube, or occasionally in the peripheral layers of the myometrium. These growths occur in the following forms: A dense, hard tumor in which the muscle tissue is in excess of the adenomatous tissue; a cystic tumor with many distinct cystic cavities; a soft adenomyoma in which the adenomatous tissue is in excess and in which germinal epithelium is present; and a telangiectatic adenomyoma.

Histologically, the tumor is composed of muscle tissue containing epithelial canals. The cystic cavities may contain pigment or bloody fluid.

Rhabdomyomata are pedunculated polypi of the cervical canal which always contain sarcomatous elements.

The treatment of adenomyomata should be radical, a supravaginal hysterectomy being the operation practised.

The cysts of the uterus developing from the remains of the Wolffian or Müllerian ducts are of very infrequent occurrence. They are usually small, though they may attain the size of a fetal head. They are lined with cylindrical or cuboidal epithelium, which may be ciliated. Polypoid pseudoplasms, the outgrowth of subacute inflammatory processes, occur more especially in the cervix, the mucosa of the corpus being rarely affected independently of the cervix. These pseudoplasms are usually small, multiple, soft, vascular growths.

The round ligament, which may properly be considered a part of the uterus, is at times the seat of certain benign neoplasms. Myomata and adenomyomata, having the same histogenesis as similar growths in the uterus, are sometimes observed in this part. Myomata of the round ligament are more common in nulliparæ, and are more frequently found on the right than on the left side. They may be intra- or extraperitoneal, are usually pedunculated, hard, painless and of slow growth, and when they are large they may give rise to pressure symptoms.

Hydrocele of the canal of Nuck may be present, forming a cystic tumor in relation with the round ligament. A true cystic myoma may develop in the parenchyma of the round ligament. Clinically, these tumors are found in the inguinal canal, beneath Poupert's ligament, or in one of the labia majora.

The treatment of these round ligaments consists of extirpation of the sac and direct suture. Should the myomata of the round ligament attain a size sufficient to cause pressure symptoms they should be removed.

Henry D. Beyer.

UTERUS, INVOLUTION, SUBINVOLUTION, AND SUPERINVOLUTION OF THE.—I. INVOLUTION.—

Involution is the process of retrograde metamorphosis by which the puerperal uterus returns from its condition of physiological hypertrophy to the normal non-gravid state. There is a broader sense in which the word is occasionally used, including those cases of reduction in the size of the uterus following the evacuation of retained contents, as in physometra, hydrometra, or hamatometra, or after the removal of submucous fibroids, uterine hydatids, or other tumors accompanied by hypertrophy. The processes in these cases are identical, but the latter conditions are relatively so rare that it is fair to disregard them and use the word in its relations to pregnancy only.

Every writer upon the subject calls attention to the wonderful nature of the change which occurs. Striking as is the alteration effected in the uterus during the nine months of gestation, by which its weight is augmented from twenty-one to twenty-four times, even more remarkable, if possible, is the process of involution by reason of its great rapidity. The increase in size of the uterus is due almost wholly to hypertrophy of the individual muscular fibres, together with the development of new fibres from previously existing embryonic cells, this latter process being probably confined to the inner layer of the muscular wall, and occurring wholly during the first six months of pregnancy.

Many authors claim that, in the process of involution of the uterus, the muscle fibres undergo fatty degeneration, that absorption takes place, or that the fatty material is carried off in the lochial discharge, that this process is followed by regeneration, that new cells which develop into muscle fibre are seen in the midst of the fatty mass, and that a new uterus is formed. The blood-vessels, both arteries and veins, participate in the process of fatty degeneration, and from the fragments of the mucous membrane which remain intact at the placental site a new one is formed.

Others of a later date, since histology has developed, claim that it is a process of atrophy—that is, a diminution in volume of the muscle fibres.

Helme¹ has made a study of the process in rabbits at all stages of the process and has examined many specimens immediately after death. He finds no evidence of a fatty degeneration and a later regeneration. There is not a pathological atrophy, but a shrinking of the muscle tissue—a physiological retrogression. It may be a chemical change, but not a fatty change. The contents of the cells become more soluble so that they can pass into the lymph stream. The atrophy continues alike in all parts of the uterus, but there are no groups of degenerated cells found in the midst of the healthy tissue.

At first the muscular fibres which at the end of labor are translucent become cloudy or dusky, and diminish in volume very rapidly for the first thirty-six hours. Then follows a more gradual shrinking up to the tenth day. Helme finds that there is no evidence that old muscle fibres are destroyed and new ones produced, but that it is a retrograde change or shrinking and that the larger fibres simply become smaller. It is simply a diminution in volume.

The change that takes place in the connective tissue is a different process. There is a gradual diminution in amount and a disappearance of the connective tissue. The connective-tissue fibres and cells become granular, and some entirely disappear, while others do not undergo the degeneration.

The veins and arteries of the uterus show the same diminution, and some again entirely disappear.

It would seem that, concerning so universal and carefully observed a phenomenon as involution, there need be no difference of opinion as regards the rate of its progress and the time of its completion, and yet absolute knowledge of the matter does not exist. The modifying conditions are so numerous, and the methods used by which to arrive at conclusions so various, that no two observers appear to agree. Pathologists judge from appearances found after death, clinicians from the relations of the fundus to the symphysis pubis, statisticians from measurements made either with the pelvimeter or with the intra-uterine sound. Sources of error only too readily creep into the observations in each case and seriously affect the deductions. Post-mortem examination furnishes, of course, positive results, and yet who can say how much the retrograde process has been interfered with, in any given case, by the illness causing death, or by the other attending circumstances during life? The relation of the fundus uteri to the pubis may depend more upon the amount of prolapse, version, or flexion, the fulness of bladder and rectum, the size of the pelvic cavity, and the degree of tension of the abdominal walls, than upon the size of the uterus. It has seemed to me

that measurement of the vertical diameter of the uterus by means of a pelvimeter must be unreliable, by reason of uncertainty as to the thickness of the abdominal wall, and as to the importance of existing flexion and of longitudinal compression resulting from the necessary expenditure of force.

Unquestionably, the best results must be looked for from the actual measurement of the depth of the uterine cavity in a large number of normal cases, at intervals, during the puerperal month. Much has been done in this line of investigation, and yet I know of no results which are at all satisfactory or conclusive. Up to eight or ten years ago, it was taught that reduction in the size of the uterus was most rapid during the second week after delivery, but that not until the end of six weeks or two months was the normal size regained, and this statement was regarded as authoritative until the appearance of a series of intra-uterine measurements,² begun by A. D. Sinclair and continued by W. L. Richardson, both of Boston. From these figures there has frequently been deduced the conclusion that involution is much more rapid than was formerly believed, and teaching has been modified in accordance with this belief. This conclusion has been partially corroborated by Charpentier, though his averages are materially larger than those of Sinclair; and Skene, in his recent work, accepts it completely.

Now were the question at issue merely one of scientific interest, having no important practical bearing upon the management of the puerperal state, it would not properly arise for discussion in this article, but it has a very vital connection with the vexed questions as to how long a patient should keep her bed after delivery, and how much latitude should be permitted her in resuming her customary avocations; and it has also a plain relation to the remaining topics to be considered under this heading. This being the case, it is not out of place here to call in question the accuracy of the reported measurements, and to assert that the old belief, founded upon post-mortem investigation, is the correct one, the one upon which all rules of conduct should be based. The reason for so confident an assertion is the knowledge that the measurements, as reported in the papers above mentioned, vary more with the skill and boldness of the house physician in passing the sound than with the condition of the patient or the duration of her puerperal period. A part of those published were made by myself, and, though septicæmia was rife in the hospital at the time, they evidenced a most phenomenal involution amounting in some cases to superinvolution. These results I knew to be untrustworthy, and yet they corresponded with the work of my predecessors.

I was succeeded in this line of work by Dr. W. J. Otis, who, believing with me that his sound rarely reached the fundus, and fearing to do injury to a soft and friable uterus by the employment of greater force, entered upon the use of a Jennison elastic sound, to which he adapted a sliding marker or guide. With this soft and elastic instrument, used with gentle yet persistent manipulation, the whole aspect of the figures at once changed, and from that time on only once did the measurement fall below three inches. He has very kindly furnished me with the results of his examination in thirty cases, after the adoption of the new instrument, and from his figures I select the following as indicative of the general conclusion. Of the 30 uteri, 6 had a depth of three inches, 5 of three and a half inches, 4 of three and three-quarter inches, and 7 of four inches. The average depth was 3.63 inches, and the average day of measurement was the seventeenth.

I learn from the house physicians of more recent years that the depth of the uterus always increases after a few weeks' experience in measuring, and that the figures are uniformly much greater during the service of some men than they are recorded by others. Though septic influences have been absent of late, yet the average depth, I am assured, is greater rather than less than it was found by Dr. Otis. The fallacy in this method of investigation lies in the fact that the uterus is so softened as to be

easily perforated, or, at least, penetrated by the sound, thus staying the examiner's hand through fear; is often flexed; is not yet lined by normal mucous membrane, but by a soft exudate in which the instrument is readily entangled; and that upon its inner surface is an elevation corresponding to the placental site, an elevation sufficiently great to obstruct the passage of the sound. The custom of examining upon the back tends to increase existing difficulties, so that I believe the fundus is by no means always reached, even by the most skilled observer, and under the most favorable conditions.

A very important series of measurements is reported by Hansen, in the *Zeit. f. Geburt. u. Gyn.*, 1887, a review of which has been made by Parvin.³ He examined 200 women, making in all 1,048 measurements with the sound. He announces that "the duration of involution was in general ten weeks; the shortest period observed was four weeks, and this in only one case, while the longest period was three months, which was observed in four women." Parvin concludes by stating that "one of the most important practical lessons to be learned from the investigations of Hansen is, that obstetricians should insist upon a longer rest for the puerperal woman. When we remember that many a woman is up and at work two or three weeks after childbirth, and that even those whose circumstances in life do not require labor are frequently participating in social pleasures and fatigues at the end of six weeks or two months, we can easily understand why disorders of the genital organs not infrequently result."

It was also found that involution was delayed in those who did not nurse.

The questions as to the influence upon involution of normal lactation, and of the routine use of ergot after delivery, are eminently practical ones, and deserving of notice. It would seem that so physiological and essential a process as suckling ought to have a favorable influence, especially in view of the intimate relation existing between the breasts and the uterus, any excitation of the former stimulating contractions in the latter. Yet this view is opposed by many observers, notably among the French. Tarnier takes conservative middle ground, holding that "the individual conditions have a much greater influence upon the course of uterine retrogression than lactation." In the face of such contradictory faiths the chances are that Tarnier is correct, and the influence of nursing is a factor of minor importance. My own belief is that it is favorable rather than otherwise, provided, of course, that the patient has sufficient strength and vigor for the physiological performance of the function. Under other circumstances the drain might easily result in such physical deterioration as materially to interfere with the restoration of the uterus.

Unquestionably, it is the custom of the majority of American physicians to administer ergot, as a routine measure, at the close of labor. Subsequently, should the uterus fail to contract firmly or retrogression prove tardy, the exhibition of the drug is continued with anticipation of benefit. Of late years, however, the wisdom of these procedures has been disputed by those who believe, not only that the practice is useless, but that it is actually harmful, it being claimed that involution is retarded thereby. This theory, while given a respectful hearing, has not as yet found favor in practice, the sanction and approval of the profession being still given to the use of ergot as outlined above.

Among other factors in determining the rapidity and completeness of involution are the duration of labor and amount of resultant fatigue; the condition of the patient's health before labor; the occurrence of lacerations of cervix or perineum; the occurrence of septic poisoning, or of local inflammatory conditions from any cause. These matters will receive more especial mention in the consideration of subinvolution. After abortion or miscarriage, unfavorable conditions being absent, involution proceeds as after normal labor, only more slowly.

II. SUBINVOLUTION.—Subinvolution is simply a state of persistent incomplete involution, the process having

by some means been arrested before the uterus has fully regained its normal state. Corresponding with the intensity of the acting cause and the time of its occurrence, the uterus may remain very large, as at the close of the first week, or it may be only moderately hypertrophied. From this fact probably has arisen much of the uncertainty which still exists as to the exact nature of the condition and of the subsequent changes which take place. So great, in fact, is this uncertainty that few writers can agree even upon a name which suitably indicates the nature of the disease, those who make use of the term "subinvolution" acknowledging that it is only clinical in its application, and by no means covers the progressive pathological changes; those who classify it under the heading "chronic metritis" for the most part disclaiming any belief in its inflammatory origin or course; and the terms "engorgement" and "infarctus" indicating only phases of, or steps in, the progress of the disease. "Chronic parenchymatous metritis" is open to the same objection as "chronic metritis," because suggesting inflammation. Thomas, in absolutely denying any inflammatory element, suggests and uses the title "areolar hyperplasia," as descriptive of a condition of the uterus of which subinvolution is by far the most frequent cause, thus regarding the latter not as a separate disease, but rather as a merely fugitive condition giving rise to "areolar hyperplasia."

However, it matters little what one chooses for a name, if only he recognizes the fact of arrested involution and acts accordingly, as witness the statement of Hart and Barbour⁴: "The term subinvolution is *etiological*, and simply expresses one mode, the most important, in which the condition to be described (chronic metritis) is produced. *Apart from the history*, it is not possible to diagnose between a subinvolved uterus and one enlarged from chronic metritis alone. Further, the condition of subinvolution is maintained by the process of chronic metritis—that is, by the formation of connective tissue. Finally, the treatment is the same in both cases." In other words, whatever the conditions in the early stages of the disease,—whether involution has been arrested in the first puerperal week by septic absorption, with a resultant uterine or peri-uterine inflammation, or in the fourth week by a mechanical displacement,—there results sooner or later, in consequence of continued hyperemia and irritation, a proliferation of connective tissue, with ultimate contraction and hardening of the whole uterine mass. These later stages constitute the "chronic metritis," or "areolar hyperplasia," above mentioned.

As regards the method by which the normal enlargement is perpetuated, there are at least two definite and diametrically opposed views, both of which, as has already been intimated, may be consistently held to be correct. Courty says⁵: "The hypertrophy of the uterus, by failure of the retrograde evolution, is a pathological hypertrophy by its permanence, but resulting from a purely physiological hypertrophy in its origin." He quotes West as claiming a fatty change with lack of absorption of the product, and claims the contrary to be true. He states that there is not a change in the texture of the uterus, but a "persistence in the number and volume of its component elements. There is not a fatty change of the uterus," but an hypertrophy by excess of nutrition.

On the other hand, Hart and Barbour state that "the condition of permanent enlargement of subinvolution is not due to the non-degeneration of muscular fibre, but to the substitution of connective tissue for the products of this degeneration."

In view of this difference of opinion, and in the lack of positive testimony on either side, it is fair to infer that subinvolution is produced in both ways, the precise process being determined in any given case by the acting cause. In either case the final result would be the same, the method of its production having been minutely described by Dr. Mary Putnam-Jacobi,⁶ as a structural alteration in the walls of the enlarged blood-vessels, "in virtue of which nutritive transudations of an albuminous

plasma took [take] place, which gradually caused [cause] a local development of connective tissue (perivascular sclerosis)." This process she claims to be inflammatory in its nature.

Etiology.—In entering upon the subject of the causation of subinvolution, we are at once in a wide and important field for discussion—wide because of the multiplicity and variety of the causes alleged, important because of the necessity for their recognition and consequent avoidance or removal. The first and most fruitful source of subinvolution is without doubt laceration of the cervix. There are some who still dispute this fact, but their number is rapidly growing less, and it is to be hoped that before many years there will be as great unanimity in asserting the necessity for closing lacerations of the cervix uteri as there is now in urging repair of the perineum after injury.

The testimony of Emmet in this matter may be considered somewhat biased, yet the accuracy of his observation and the truthfulness of his statement can hardly be called in question. He says: "In closing this brief chapter, I would state that, for many years past, I have met with few or no cases of subinvolution which were not due to laceration of the cervix." T. A. Reamy, in the "American System of Gynecology," pointedly remarks "that if a laceration of the cervix is observed, more or less subinvolution, either of the whole uterus or of the cervix alone, is almost absolutely certain."

The means by which the result is produced are not difficult to understand. In the first place the presence of an open wound, and, later on, of either a mass of cicatricial tissue or an everted and eroded surface of mucous membrane, serves as a constant source of irritation to keep up an active hyperemia of the uterus. However, in the early weeks, the very effort of nature to repair the damage is opposed to the process of involution, and subsequently, as the wound remains and the irritation persists, the permanence of the hypertrophy is insured by the development of an endocervicitis and an endometritis. It is not necessary that the laceration should be a large one, for even very superficial tears, if exposed to the deleterious influences of an irritating vaginal discharge and denied, by the restlessness or too early effort of the patient, the quiet needed for repair, may fail to heal kindly, and so produce the same result as the deeper lesions—at least so far as our subject is concerned.

Septic absorption is, without question, a far more frequent cause of subinvolution than will be admitted by the mass of practitioners, and a present shame it is, in this age of preventive medicine, that this statement should be true. Not that in every case of subinvolution due to this cause there should have been a well-marked run of "puerperal fever" so-called; but where antiseptic, or at least aseptic, methods are despised or neglected, nothing is more common than to have, during the first week of convalescence, a rise of two or three degrees in the temperature (commonly called milk fever), the presence of fetid lochia, and moderate abdominal tenderness. In many of these cases there is set up a sufficient degree of uterine or peri-uterine inflammation to interfere seriously with the process of involution; and if this be true of these mild cases, much more surely will subinvolution follow the more marked instances of septic intoxication. Given a case of puerperal septicemia, and subinvolution may be confidently predicted.

The next cause to receive attention ought perhaps to have been given precedence over the last. It is the faulty management, or rather the mismanagement, of the period of convalescence; and by mismanagement I mean the permission of too much freedom in movement and of too early rising. I am well aware of the fact that patients are not only allowed to be up and dressed before the end of the first puerperal week, but that such a course is even advised by men who are otherwise safe and skillful practitioners and good observers. That the reasons which they give for such a custom have some weight is not denied, but it is far from true that the custom is either a safe or a desirable one. The general weakening

and loss of tone of the muscular system, due to a stay in bed of three weeks' duration, is far more than compensated for by the complete rest of the nervous system and the diminution in size of the soft and heavy uterus. The emptying of the uterus and vagina of clots and lochial discharge can be better accomplished by ergot and a douche than by sitting up upon a chamber vessel or chair as advised and practised by Goodell, and without the danger of the latter course.

Another frequent cause is the nervous condition.

Bennett⁸ says that he believes that, in subinvolution, the nervous power is so altered in its constitution that vascular congestion of an immoderate amount is permitted, which in itself further increases the trouble by paralyzing the nervous control over the emptying channels, the loose cellular tissue of the late pregnant uterus being well suited for such lesion to occur in. And then we must consider the rapidity of its growth, the enormous distention of its walls, the pressure both from within and from without which it has to bear, as well as the nervous shocks conveyed from mental impressions.

It is a well-known fact of physiology that if a nerve has been bruised or injured between the point of irritation and the muscle, such an injury will often be followed by defective nutrition of the part supplied. We have injuries here which may pass unseen, due to the long-continued pressure of the foetal head in tedious labors—especially where the delay is in the first stage—the division and bruising of the nerves causing a subsequent loss of function.

The way in which subinvolution is caused by early exertion, and especially by a too speedy assumption of the upright posture after labor, is by the production of displacement of the uterus, prolapse, version, or flexion, and consequent interference with the local circulation, and hence with the process of fatty change and absorption. The uterus remaining large, the displacement continues and increases, the hyperemia is perpetuated, and the chronic changes already outlined proceed to their full accomplishment. By far the safest course is to take conservative ground, and insist upon a sufficiently prolonged rest in the horizontal posture to permit of a near approach of the uterus to its normal size, and then to make a gradual and cautious return to the ordinary habits of life. The rule of Tarnier is a good one, and certainly does not err on the side of conservatism. Provided the uterus cannot be felt above the pubis, the lochia are no longer bloody, and no fever exists, he permits his patients, between the fifteenth and twentieth days, to be moved to a reclining chair where at first they remain only one hour. The time being lengthened by one hour daily, in three or four days they are ready to try a few steps, and so gradually to gain power to walk without fatigue or injury.

Very painful and tedious labors, by leaving the patient in a state of complete exhaustion from which recovery is slow and uncertain, are probably not infrequently the cause of subinvolution. In this case there is a lack of tonicity in the vessels, the active process of removing the waste and building up the new uterus is imperfectly carried on, a passive hyperemia persists, and the disease is gradually developed. Severe hemorrhage, either before or after delivery, would act in the same way, by lowering the vital powers and by diminishing the oxidizing properties of the blood.

If the subinvolution is due to hypertrophy of the decidua or to retention of parts of the placenta, membranes, or clots, these should be removed by the use of the curette. Placental adhesions form a source of especial danger, for they keep up an irritation which causes a localized subinvolution, and this in turn has a tendency to become general.

Various other causes have been suggested, such as incomplete emptying of the uterus at the completion of labor, the presence of tumors in or about the uterus, and sexual excitement due to too early intercourse, or even to sharing the same bed by husband and wife. It is to this latter cause, doubtless, that not a few cases of puer-

peral hemorrhage may rightly be attributed; and it is therefore fair to assume that it is capable of setting up a sufficient amount of pelvic congestion to render subinvolution likely.

As predisposing causes may be mentioned a poor state of health from whatever cause, frequent and rapidly recurring pregnancies, and abortions.

Frequency.—For some years after Simpson first called attention to the "Morbid Permanence of the State of Puerperal Hypertrophy," occasional cases were reported from various quarters, but the condition was considered to be an infrequent sequel to pregnancy. Of late years, however, with improved methods and more exact knowledge in the matter of gynecological diagnosis, subinvolution is found to be one of the commonest of the morbid results of childbearing. If it be true that the above-mentioned causes are apt to produce a "morbid permanence of the state of puerperal hypertrophy," then it is by no means to be wondered at that subinvolution is a frequent condition among parous women. It is impossible to give statistics of any value on this point as, in the nature of the case, they must vary materially in the practice of different men, in hospital and in private practice, and also because of the confusion in nomenclature and classification.

The condition once established, from whatever cause, it tends to develop into the more intractable, and oftentimes incurable, disease already referred to as chronic metritis, or areolar hyperplasia; hence the importance of the early recognition of the danger, that the cause may be removed and complete involution secured at the proper time. This point will receive more particular consideration under the head of treatment.

Symptoms.—The history of the case from the patient's own lips indicates that the commencement of the trouble began at a previous confinement. Frequently there has been a previous attack of puerperal sepsis, peritonitis, parametritis, or evidence of some form of septicæmia. Post-partum hemorrhage is often a precursor of this condition.

Such patients almost always complain of backache, and this may be the chief cause for which treatment is desired. There is almost always some disturbance in the menstrual function. This is usually an irregularity indicated by a menorrhagia, a condition in which the periods are of longer duration and come more frequently than is normal. Menorrhagia may be present often in connection with menorrhagia, and the result of the latter may be so profound as to produce an excessive anæmia. Dysmenorrhœa is often present, due to the engorgement of the already enlarged uterus, which also causes the severe pain. Leucorrhœa, although not always present, may be an accompanying symptom. Its presence, however, denotes an inflammation of the endometrium rather than a simple subinvolution. In weak and debilitated patients there is usually amenorrhœa.

Pain is a very uncertain symptom. Headache is sometimes present; it is referred especially to the crown of the head and is burning in character, occurring at or near each catamenial period. Pain is also localized in the pelvic region, but may be referred to more remote parts of the body, such as the back, hips, legs, and also the breasts. The pain is not of so severe a type as that of chronic metritis.

When the uterus is large and heavy and retroverted, as is often the case, there may be persistent constipation, which usually results in hemorrhoids. Vesical tenesmus may exist from pressure on the bladder or from dragging upon that organ.

The physical signs are especially valuable when acquired by a careful examination. The uterus is found to be soft, flabby, and symmetrically enlarged, more globular in form than normal, and is often displaced. The cervix is also large, with usually a laceration, and the os is patulous, often permitting the entrance of a finger as far as the internal os. The sound passes to a greater depth than normal, and is quite easily moved about; its introduction may cause a profuse bleeding.

Diagnosis.—It is by no means a simple and easy matter to make a positive diagnosis in any given case, unless the patient has been under continuous observation since the pregnancy from which the condition dates, for the reason that the term is rather expressive of a clinical fact than of a pathological process. The uterus may have undergone a perfect involution, the hypertrophy developing subsequently as a result of an endometritis, of a displacement, or of ovarian disease. A probable diagnosis may, however, be made in most cases by a careful comparison of the symptoms and physical signs, the former having dated from a previous confinement or from a period not long thereafter.

On account of the softness and moderate sensibility of the uterus in many cases, the condition may be mistaken for pregnancy in its early weeks, or *vice versa*. In case of doubt, it is far better to wait for time to indicate the true diagnosis than to run the risk of producing abortion by passing the sound. This word of warning is not an idle one, for the accident has often happened to the impatient and thoughtless, and should be guarded against by excess of caution. It is not impossible that the two conditions may coexist, and this possibility furnishes an additional cause for care.

In view of the uncertain relations existing between subinvolution and chronic metritis, and because, if they be separate diseases, the treatment of each is the same, it is hardly worth while to attempt a nice discrimination. If the disease be subinvolution pure and simple, with no metritis or "perivascular sclerosis" grafted upon it, the uterus will be softer and more doughy than normal, will measure three inches or more in depth, and pressure upon it will be easily borne. Where there exists the condition described as chronic metritis or areolar hyperplasia, the uterus is hard and sensitive, and there is usually more or less constant pain in the hypogastric region. The uterus is movable in both conditions, unless there be adhesions or accompanying perimetritis.

Fibroid tumors increase the bulk of the uterus and elongate its cavity, but they can almost always be felt as local enlargements of the uterine mass, or at least the enlargement is not uniform. The history of the case will usually fail to show any causative relation of pregnancy. The appearance of the cervix will often be of assistance, it being usually of normal size and density in the case of tumors wholly confined to the uterine body. Malignant disease confined to the body of the uterus might be mistaken for subinvolution on account of the tendency to hemorrhage, the uniform enlargement, the lack of pain, and the absence of sensitiveness commonly noted in the early months. The age of the patient, the continual presence of a watery discharge, and sometimes the offensive odor, together with the wasting strength, should suggest the nature of the disease, and microscopic examination of shreds removed by the curette will determine it.

Prognosis.—The prognosis of simple subinvolution which has not yet progressed to the sclerotic stage is good, provided suitable treatment be adopted. When the condition is allowed to go untreated, its tendency is to run through the several stages of fibrous deposit, induration, contraction, atrophy. Under these conditions its course is very variable, being influenced by a great number of factors. In some instances the complete course outlined above appears to have been run through inside of a year, yet on the other hand there are cases which seem to remain almost stationary for years. When the stage of fibrous infiltration has been reached—and most cases presenting themselves for the relief of symptoms have already entered upon it—the prospect of complete cure and restoration to the normal is poor. As a rule, the most that can be expected is the relief of the principal symptoms, partial reduction of the existing hypertrophy, and the avoidance of more serious complications. The uterus may also be placed in a more favorable condition for the occurrence of pregnancy, and for its successful completion.

Treatment.—To a very considerable extent subinvolu-

tion is preventable, and hence prophylactic measures should be first considered, and uniformly practised. It is unnecessary to urge the importance of having every woman approach her confinement in the best possible state of health. Of course existing disease will be combated and removed so far as possible, but let the physician also set his face against every depressing influence so often invoked by women to diminish the size of the fœtus and thus to insure an easier labor. Let good diet, fresh air, and plenty of exercise be invoked to aid in establishing or continuing a condition of vigorous health previous to delivery.

The importance of insisting upon a recumbent posture and absence of effort during the first two weeks, and upon a gradual and cautious getting up after labor, has already been referred to.

As septic causes have much to answer for in the production of the disease in question, they must by all means be guarded against, and with the present light upon the subject of aseptic midwifery there is no excuse for the man who neglects such simple precautions as are universally agreed upon. In this connection Goodell⁹ says: "The day is surely coming when, in a case of puerperal fever in one's private practice, will be deemed a crime."

Tedious and very painful labors being, by their exhausting influence, factors in causing, or at least in favoring, the occurrence of subinvolution, they should be avoided so far as possible by the use of forceps and of the various anæsthetic agents. Chloral during a long first stage is capable of giving rest and relief from pain, with proportionate lessening of exhaustion. Ether and chloroform properly used are perfectly safe, and they can be given, if necessary, for long periods without materially delaying the progress of labor, and even with the effect of shortening the duration in many cases. Furthermore, they diminish rather than increase the risk of hemorrhage, and in almost every instance they diminish the severity of the suffering, reduce the fatigue to a minimum, render the convalescence more speedy, and insure a more rapid and certain involution. There is less need of commendation of the forceps, yet if the baneful influence of an unnecessarily prolonged second stage be borne in mind, it will be acknowledged that no mere prejudice against operative interference should be permitted to prevent the timely employment of this means of abridging wear and tear.

Lacerations of the cervix having been shown to result almost inevitably in subinvolution, it follows, as a corollary, that the presence of such tears should always be sought for after labor, in order that this and other possible consequences may be averted by suitable treatment addressed to the lesion. Conversing with a successful fellow-practitioner recently upon this subject, I was assured that not one physician in a hundred makes a practice of examining his patients during or at the close of the puerperal month, and that such a custom is uncalled for. If this belief is general and the former assertion correct, and I believe them so to be, the frequency of subinvolution is to a large extent accounted for. He is a bold man who will fly in the face of such unanimous testimony as now exists to the contrary, and assert that laceration of the cervix is not liable to result in subinvolution, or that it matters not if it does, as the latter condition is one of no importance; yet one of these positions must be taken by the man who disbelieves in the practice of examining his puerperal patients before permitting them to pass from his hands. Unless some special symptoms seem to demand interference, it is well not to examine until after the completion of the second week, and better still is it to wait until the close of the third week, or even of the puerperal month. By this time involution should be well advanced, and the cervix should have returned nearly enough to the normal to enable one to judge well as to the extent of any laceration, should one be present. The treatment of such lacerations needs no consideration here, as this branch of the subject has been fully covered in another article; but the importance

of caring for them at an early date cannot be too strongly enforced.

When the examination is made as recommended, any other existing condition which may serve as a possible cause of trouble can be noted and will receive due attention. It is taken for granted that any rupture of the perineum has been previously sutured, but the success of the operation is now to be assured. If the uterus is displaced, it must now be returned to its normal position, and sustained there by glycerin tampons or a pessary.

When subinvolution is discovered soon after labor, simple removal of its causes will usually suffice for a cure. Later on, when the patient applies for treatment for the relief of symptoms, the problem is by no means so simple. Measures directed toward the elevation of the general tone of the system are always called for. Tonic remedies, liberal diet of the right sort, general sponging followed by brisk rubbing, and, in those cases in which suitable exercise cannot be taken, the employment of massage, are to be advised. It being assumed that we have removed all existing local conditions which may serve to perpetuate the disease, our efforts must be turned more directly to the removal of hypertrophy and the restoration of function of the diseased organ.

In almost all cases there exists hyperæmia, which is, indeed, the important element in the continuation of the trouble. This should be attacked by puncture, by scarification, or, better still, by the application of leeches to the cervix; the use of glycerin tampons and of hot douches also aids in reducing hyperæmia. If hot douches are to be of any value, they must be administered while the patient is lying upon her back, with her hips raised; the temperature of the water must also not be less than 110° F., and the douching should be continued for at least fifteen minutes. Painting the cervix with Churchill's tincture of iodine can do no harm, and is often of great benefit. In those cases in which the cervical canal is patulous, and active endometritis is absent, the application of iodized phenol to the uterine cavity by means of an applicator is of marked utility. Such an application should be made about once a week.

Electricity is highly recommended by many writers of recent years, and it has given good results where other means have been tried in vain. Both the galvanic and the faradic currents are of value, either separately or in combination. The faradic current is chiefly available, in recent cases, for promoting contraction of muscular fibre and diminution of hyperæmia. The galvanic current finds its most important application in the later cases, in which fibrous deposit has already taken place.

Massage¹⁰ has not as yet formed an important factor in the treatment of subinvolution, but there are men who advocate its use very strongly. If no contraindications exist, massage may be employed to the best advantage in the first stages of subinvolution, when the uterus is hyperæmic, and when it is found low down in the pelvis, tender, spongy, and having a doughy, elastic condition. If there is an accompanying retroversion this treatment is not precluded; but when the uterus has become hard and firm and has lost its soft spongy feel, massage is useless.

Not infrequently there coexists with subinvolution, or springs up in consequence of it, a condition of hyperplastic endometritis, which is largely accountable for the hemorrhagic symptoms. In such cases it may be necessary to remove the diseased membrane by the use of the sharp curette, following it, in intractable cases, by the application of tincture of iodine, or even of iodized phenol. This, of course, is to be regarded as a surgical operation, strict aseptic precautions being observed, and the patient being confined to bed for several days thereafter.

In some refractory cases of subinvolution, operative interference has been practised by Reamy and others. This consisted in "removing a wedge-shaped piece from the cervix, and closing the rent with sutures as in trachelorrhaphy. . . . when laceration of the cervix did not exist." Good results are reported from this operation.

When a patient has advanced beyond the puerperal state and subinvolution still persists, notwithstanding all our efforts to remedy the condition, relief may be looked for in pregnancy. If the patient becomes pregnant the uterus may, in its natural evolution and in its subsequent involution, if no contrary condition hinders, return to its natural size again.

Subinvolution of the Vagina.—In the vagina, as in the uterus, the process of hypertrophy and development continues throughout pregnancy, to be followed after delivery by a process of involution almost identical in its method and purpose with that which occurs in the uterus. By this means the vagina is restored, in about two or three months, very nearly to its normal nulliparous condition, remaining permanently, however, a little larger than before. This perfect result is, unfortunately, by no means always accomplished, and subinvolution of the vagina is, like subinvolution of the uterus, of common occurrence.

The causes of incomplete involution of the vagina are, for the most part, those that have already been assigned as factors in the production of uterine subinvolution, the latter almost always being accompanied by more or less vaginal subinvolution. The cause which most uniformly and certainly interferes with the process of involution in the vaginal walls is, without doubt, laceration of the perineum or pelvic floor. While laceration of the perineum in its entire thickness is common, laceration of the posterior vaginal wall, together with the inner portion of the perineal body, is, if possible, a still more frequent accident, and is followed by more disastrous results. When a rupture extends through the fourchette, and even more deeply into the skin of the perineum, the injury cannot fail to be noticed by the most casual observer; but when internal inspection is necessary to disclose the rent the chances are strongly against its discovery. The average physician considers his duty done when he inspects the perineum externally, and to his great satisfaction finds that "not even the fourchette is torn," forgetting or not knowing the fact, so strongly insisted upon by Mathews Duncan, that the point at which laceration usually, and in primiparæ almost inevitably, begins is at the ostium vaginae, not at the ostium vulvæ—at the plane of the hymen, not at the fourchette. In examining the perineum after labor, therefore, look carefully to the mucous surface.

Prophylactic methods of treatment will be the same as those outlined above for subinvolution of the uterus, especial stress being laid upon the care of the perineum both during and after labor. Curative treatment, after known or possible factors in the production of the disease have been removed, will consist in the use of douches, occasional applications of iodine, with insertion of glycerin and alum tampons, and the employment of electricity. While both the faradic and the galvanic currents are of utility, and many prefer the latter, my own preference is strongly for the former. By the employment of a bipolar electrode active contraction of the muscular fibres is brought about, their tone is thereby improved, passive hyperæmia is removed, absorption is stimulated, and the uterus is more firmly supported.

Operative interference is often called for to repair old injury to the perineum or cervix, to remove cystocele and rectocele, or to narrow and shorten a redundant vagina, which, by the simpler means mentioned, cannot be reduced to the normal.

III. SUPERINVOLUTION.—Nominally, superinvolution is an excess of involution, by which the uterus is reduced to less than its normal size, yet it is an open question whether just this process really occurs. Undoubtedly cases are noted, and with increasing frequency, in which, at some time after the completion of puerperal convalescence, the uterus is found in a state of atrophy; but is this atrophy due to excess of the normal process with failure in the regeneration of muscular fibre; or is it not rather fibrous contraction following upon actual inflammation or occurring as a sequence of subinvolution; or, finally, is it not possibly a result of disease of the ovaries

by which their function is destroyed, and hence corresponding to the senile atrophy of the menopause? The present attitude of the profession toward this disease is one of observant scepticism. It is too soon for any one to assert dogmatically that superinvolution, pure and simple, does not exist; yet before making that diagnosis in any case it would be well to consider carefully if there be not some other disease of which the atrophied uterus is merely an expression or consequence. Even the classical case of Simpson—the case which first suggested to his mind the title under consideration—is more likely to have been one of premature atrophy and cessation of function due to tuberculous disease.

But whatever opinion may be held concerning the accuracy of the term, it must be admitted by all that uterine atrophy does occur, without apparent cause, in a certain number of cases, not long after delivery, and to this condition has rightly or wrongly been given the name superinvolution. That the condition is a rare one is shown by the scarcity of reported cases, and by the fact that most writers upon the diseases of women ignore the subject completely.

As regards the pathology of superinvolution, it can only be said that the uterus resembles that organ in a state of senile atrophy. Observations are too few to afford any definite information concerning the morbid processes involved.

There are no distinctive or constant symptoms which belong to the disease, with the single exception of amenorrhœa, or scanty menstruation. Besides this, there is the ordinary train of symptoms common to many another form of uterine disease. Examination reveals simply a non-sensitive uterus, of less than the normal size and depth. The ovaries, if found at all, are commonly much smaller than normal, and are not infrequently bound down and compressed by adhesions.

The disease is a very intractable one, though the prognosis will vary in accordance with the pathological conditions which stand in causative relation to the atrophy. In some cases, diagnosed as superinvolution, a cure has been achieved and pregnancy has followed; but it may be laid down as a rule that most cases will prove absolutely rebellious to treatment, and sterility will be permanent.

The only treatment which has been found of value is one having for its purpose stimulation of the uterus, and this is best accomplished by the conjoined use of moderate cervical dilatation and electricity. Either a Hanks or a steel-branched dilator may be used to stretch the cervix slightly every week or ten days. Rockwell recommends that both the faradic and the galvanic currents be utilized, and relates one case in his own practice in which menstruation was thus induced in a patient whose uterus measured but one and three-quarter inches. The poles of the faradic battery may be used indifferently, but when the galvanic current is employed Rockwell advises that the negative pole be placed within or against the uterus.

Rufus A. Kingman.
Revised by Eugene E. Eckerdt.

REFERENCES.

- ¹ Transactions of the Royal Society of Edinburgh, vol. xxxv., p. 2, No. 8.
- ² Transactions of the American Gynecological Society, 1879, 1881, 1882.
- ³ Annals of the Universal Med. Sciences, 1888.
- ⁴ William Wood & Company, 1883, vol. ii., p. 8.
- ⁵ Second edition, p. 710.
- ⁶ American Journ. of Obstetrics, 1885.
- ⁷ Prin. and Prac. of Gynecol., second edition, p. 447.
- ⁸ Edinburgh Med. Journ., vol. xl., p. 524.
- ⁹ Lessons in Gynecology, third edition, p. 544.
- ¹⁰ Boston Med. and Surg. Journ., vol. ciii., p. 291.

UTERUS, VAGINA, ETC., TUBERCULOSIS OF.—The relationship between tuberculosis of the uterus, vagina, and vulva, and tuberculosis of the Fallopian tubes, ovaries, and peritoneum, is so close that in the general consideration of the subject it will be necessary to make reference to tuberculosis of the structures above the ute-

rus, which subjects do not strictly belong to this particular chapter. (For a full consideration of tuberculosis of the uterine appendages and peritoneum see the articles on *Fallopian Tubes, Diseases of*; *Ovaries, Diseases of*; and *Peritonitis, Septic and Tuberculous* [in the Appendix].)

GENERAL CONSIDERATIONS.—Tubercle bacilli gaining entrance to the circulatory systems of the body show what appears to be an elective preference for certain organs. Thus, in the order of frequency, it is found that the involvement affects the lungs, lymphatic glands, mucous membranes, serous membranes, bones, spleen, kidneys, adrenals, brain, genital organs, bladder, and skin. Age has an influence upon the relative susceptibility of the organs, the lungs being most frequently involved in adults, and the lymph glands, bones, joints, and meninges in children. In the female organs of reproduction the order of the frequency of involvement is: Fallopian tubes, uterus, ovaries, vagina, cervix, and vulva. As tuberculosis of these parts is frequently overlooked or mistaken for other lesions, this order may be subject to later modifications. Tuberculosis of the genitals is nearly seven times more frequent in women than in men. Gonorrhœal and other chronic inflammatory conditions appear to increase the susceptibility of the generative organs to tuberculosis.

That the more frequent involvement of certain parts of the body over others is due less to the portal of entry than to differences in the relative susceptibility of the organs themselves, is indicated by the observations made upon lower animals that have been infected by subcutaneous inoculation, intravenous injection, ingestion or inhalation of the bacilli. In such animals a tendency of the bacilli to grow more frequently and more luxuriantly in certain organs is observed. The susceptibility of a particular organ obviously is modified by the degree of general resistance to tuberculous infection possessed by the individual, and by the virulence of the special bacilli concerned. Against the most virulent forms of the tubercle bacilli it is probable that no man and few organs are immune, while other species of the micro-organisms are so attenuated as to be able to produce disease only in persons of greatly enfeebled resistance, and then only in the more vulnerable organs.

Although it is probable that the organs most frequently involved, such as the lungs and lymph glands, are, as a general rule, most susceptible, it is not improbable that in certain individuals the order of the relative resistance of the special organs varies. In this way may we explain the occasional primary colonization of tubercle bacilli in the female genital organs, despite their entrance into the body through the digestive and the respiratory tracts, or through some other remote portal. In such instances it may be that no lesion marks the point of entry of the bacilli, nor the channels traversed by the micro-organisms in passing to the reproductive organs.

CHARACTER OF THE INFECTION.—Much stress has been placed upon the question as to whether the lesion in the genital organ be primary, or the initial tuberculous focus in the body, or secondary to some other lesion in a contiguous organ or in a distant part from which the bacilli have been carried by the blood- or the lymph-stream. Practically, however, the secondary character of the disease of the genitalia has little influence upon the treatment in the case, provided that the primary lesion be of a trifling character. Far more important is the determination of the dominant, determining, or dangerous lesion in the body. Thus, a tuberculous uterus or ovary, whether primary or secondary, rarely requires the attention of a gynecologist in the presence of advanced pulmonary disease, yet is of great importance when the lesion elsewhere in the body, even though it be primary, is slight and stationary in character.

More important than the primary or secondary nature of the disease—for this may have little influence upon the treatment—is the consideration of the mode of entry of the bacilli, which concerns the prophylaxis against these lesions. As a rule, however, the portal of entrance is

difficult to determine, as the bacilli may pass through the mucous membrane and traverse the lymphatic or blood channels without leaving any gross or microscopic evidence of their path. Again, evident primary lesions may indicate the portal of entry.

The bacillus may enter directly through the external genitalia, a condition known as *ascending* infection, or through contiguous organs and remote portions of the body, by means of the blood- or the lymph-stream, designated as *descending* infection.

MODE OF INFECTION.—Ascending infection may occur through contact with contaminated fingers or utensils. Thus, a consumptive may reinoculate herself by sputum carried on her hands, while the more serious danger of initial infection may attend the ministrations of a careless tuberculous physician, midwife, or nurse.

While it is difficult to offer the convincing evidence of concrete instances, the possibility of infection in coitus from disease of the genito-urinary organs, or from the use of tuberculous sputum as a lubricant, is to be considered. The descending form of infection is much the more frequent, although usually it is as difficult to determine the precise portal of entry as it is to give absolute evidence of the primary nature of the lesion. It is apparent that for the most part this will remain supposititious.

The bacilli may be directly carried in the blood or lymphatic vessels from the mucous membranes of the respiratory, digestive, or urinary systems, or from surface lesions of the skin, to the pelvic organs. Often primary lesions mark the path of the invaders, and not infrequently the genitalia are infected by proximity to tuberculous organs, such as the intestines and bladder, or because their peritoneal covering shares in a generalized tuberculous peritonitis.

CHARACTER AND FREQUENCY OF THE LESIONS.—The lesion may appear in the form of either gray or yellow miliary tubercles, cheesy or puriform foci, masses of imperfectly organized peritoneal exudate, granulation tissue, or chronic ulcerations of the mucous surfaces. The liquid exudate may differ from other inflammatory peritoneal effusions in the presence of small numbers of polymorphonuclear leucocytes and of fibrin, and the presence of many mononuclears and the tubercle bacilli. Most frequently the disease occurs in the form of miliary tuberculosis of the pelvic peritoneum, and is but a part of a more generalized process. At times the tubercles, which appear as slightly raised, firm, grayish or yellowish nodules, from 1 to 3 mm. in diameter, are limited in their distribution to the peritoneal covering of the uterus and its appendages, and may or may not be associated with pelvic exudate and adhesions.

The Fallopian tubes are affected more frequently than any of the other reproductive organs. Besides the form in which only the peritoneum is involved, there is the interstitial type, in which the tube shows a great thickening of its walls, the presence of tubercles, and at times of a serous inflammatory œdema in the muscular walls. Finally, the chief involvement may be the mucous lining, which may show miliary tubercles, or, if the process be advanced, ulceration, or the mucous lining of the tube may be entirely destroyed and the organ greatly distended by a puriform or caseous material. This resembles a pyosalpinx, but the microscope shows the fluid to consist largely of necrotic substance rather than of pus. There is also less tendency for the ostium to become closed than in other forms of salpingitis.

The tube may contain many ounces of fluid, giving it an enormous size. Localized collections of a more or less puriform fluid, walled by masses of exudate and adherent organs, may be mistaken for ovarian cysts. The ovary may be infiltrated by tubercles or distended by large necrotic and cheesy foci.

In the uterus, apart from the miliary tuberculosis of its peritoneal covering, the disease chiefly attacks the endometrium. Miliary tubercles, ulcers, or, when the process is more progressive, the destruction of the endometrium and adjacent muscularis, and the distention of the