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OSTEOMYXOMA. See *Myxoma*.

OSTEOPOROSIS. See *Atrophy*.

OSTEOPSATHYROSIS.—This term is used in a general sense to designate the condition of excessive brittleness of the bones, and is practically synonymous with *fragilitas ossium*. It may occur as the result of senile or cachectic atrophy, prolonged activity, pressure atrophy, neuropathic atrophy in such diseases as paralytic dementia, locomotor ataxia and syringomyelia, and in syphilis, leprosy, osteomalacia, and rachitis. In rare cases the condition appears in an idiopathic form, apparently of congenital origin, and may be inherited. The etiology and pathology of this form are unknown. Senile osteopsathyrosis is the result of the old-age osteoporosis. The skeleton as a whole, or only certain portions, may be involved. The bones usually become fragile and are easily broken; but in other cases the bones lose their lime salts to such an extent that they may be easily bent or may be cut with a knife. A similar condition may occur in the cachexia of various chronic diseases. In syphilitic infection of long standing and associated with marked cachexia, there often occurs a marked osteopsathyrosis of the long bones and also the bones of the cranium. In the great majority of syphilitics there is an increased fragility of the skeleton. In leprosy there is found in a certain class of cases a very characteristic osteopsathyrosis (leprous osteomalacia) affecting chiefly the bones of the hands and toes. The phalanges, one after another, may be affected until all the fingers and toes are destroyed, or they may be irregularly involved. (See also *Bones, Osteomalacia, Leprosy, Syphilis, Atrophy*, etc.)

Aldred Scott Warthin.

OSTEOSARCOMA. See *Sarcoma*.

OTTAWA, CANADA.—Ottawa, the capital of the Dominion of Canada, is situated upon the river of that name, in the eastern part of the Province of Ontario, about one hundred and ten miles west of Montreal. It has a population of about fifty thousand, and is the centre of a large lumber traffic. The extensive government buildings are noteworthy for their architecture and material; and in the vicinity are various points of scenic interest—the Chaudière and Rideau Falls, and the Rideau Canal with its series of locks. A journey down the Ottawa River to Montreal (ten hours) is one of great interest, and affords

CLIMATE OF OTTAWA. LATITUDE, 45° 26' N.; LONGITUDE, 75° 41' W.—PERIOD OF OBSERVATION, FOURTEEN YEARS (BROKEN PERIODS).

	January.	March.	June.	August.	October.	Spring.	Summer.	Autumn.	Winter.	Year.
Temperature, Degrees Fahr.—										
Average or normal	10.6°	20.5°	64.9°	65.7°	45.0°	38.3°	66.4°	43.9°	12.7°	40.3°
Average range	18.3	16.5	19.8	18.9	18.5					
Mean of warmest	35.3	43.2	70.2	79.9	62.9					
Mean of coldest	17.0	26.7	50.4	61.0	44.4					
Highest or maximum	53.1	55.1	95.3	98.5	80.4					
Lowest or minimum	-33.0	-32.0	34.7	34.1	17.0					
Humidity—										
Average relative	88%	83%	72%	77%	82%	74%	75%	82%	88%	80%
Precipitation—										
Average in inches (rain or snow)	2.81	3.02	2.08	1.81	2.73	7.13	5.79	7.84	8.64	29.40
Wind—										
Prevailing direction	NW. & NE.		W.	W.	NW. & E.	NW. & E.	W. & E.	W. & NE.	NW. & NE.	
Average hourly velocity in miles	8.1	NW. 7.5	4.9	3.8	5.1	6.6	4.2	5.4	7.6	6.0
Weather—										
Average number of clear days	7.5	7.5	10.7	12.3	6.5	27.0	31.0	18.7	17.9	94.6
Average number fair days	10.2	9.2	13.7	13.3	9.7	32.7	41.0	33.2	27.7	134.6
Average number of clear and fair days	17.7	16.7	24.4	25.6	16.2	59.7	72.0	51.9	45.6	229.2

commonly given at from gr. $\frac{1}{30000}$ to gr. $\frac{1}{1000}$. It is really probably much larger, though its little known character requires that it be used with great caution.

Ouabain has been employed as an antispasmodic in whooping-cough, by Dr. William Gemmill, of Glasgow (*British Medical Journal*, April 26th, 1890). He reports the treatment of forty-nine cases, of which twenty-five had been dismissed cured, four had died, and the remainder were under treatment. The fatal terminations were due to diphtheria, meningitis, and progressive emaciation. From his observations, he arrives at the following general conclusions: 1. Ouabain is of marked benefit during all stages of whooping-cough, and if carefully used produces gratifying results. In the first stage it cuts short the attack; in the second, it reduces the violence and frequency of the cough, and diminishes the number of whoops; and in the third, it hastens convalescence in a remarkable manner. 2. Ouabain is a drug which does not appear to be cumulative; its administration can be stopped suddenly without any ill effect beyond an exacerbation of the whooping-cough; it can be as suddenly resumed. 3. It should be given, at first at any rate, in a dose of gr. $\frac{1}{30000}$ every three hours (gr. $\frac{1}{12000}$ daily). 4. For children under one year of age the dose should not exceed gr. $\frac{1}{30000}$ every three hours. 5. In children of from six to twelve years of age, if the cough be very violent and the whoops are numerous, gr. $\frac{1}{30000}$ may be given in each dose, but the action of the drug must be carefully watched. 6. Ouabain may be given alone, dissolved in water, or in combination with potassium bromide, or with chloral hydrate. The simplest way is to dissolve one grain in distilled water, so that each minim of the solution shall be equal to gr. $\frac{1}{10000}$ ouabain, as: ℞ Sol. ouabain, ℥ xlvij.; syr. aurantii, ʒ iv.; aq. ad ʒ vi. M. Sig.: A teaspoonful every three hours. 7. Under the administration of ouabain, it is found that the temperature, pulse, and respiration are, in uncomplicated cases, slightly below normal. When the drug is pushed, the respirations become very slow indeed; in one patient, aged four, they were often as low as sixteen per minute. It is from this that danger is to be expected. During the administration the action of the skin is promoted, the amount of urine is increased, and the movements of the bowels become more regular. Ouabain has also been used with equally satisfactory results by Dr. J. Lindsay Porteous, of Yonkers, N. Y. (*New York Medical Journal*, vol. liv., 345). He gave it in three cases, one adult and two children, and in all marked improvement was immediately noticed. To a child of fifteen months gr. $\frac{1}{30000}$ was given every three hours; to a child of four years, gr. $\frac{1}{30000}$ every four hours, and to the adult, gr. $\frac{1}{30000}$ every three hours. In all these cases the patient was entirely well at the end of a week. *Beaumont Small.*

OURAY SPRINGS.—Ouray County, Colorado. Post-Office.—Ouray. Hotel and cottages.

ACCESS.—Via Denver and Rio Grande Railroad (narrow gauge) from Denver, Colorado Springs, and Pueblo.

The town of Ouray is situated in a picturesque amphitheatre of the Rocky Mountains, 389 miles from the city of Denver. The altitude of the town site is 7,500 feet above the sea level, but the neighboring mountain peaks tower several thousand feet higher. Mount Sneffels, five miles west, reaches an elevation of 14,225 feet, while Uncompahgre Peak, ten miles east of the town, attains the superb altitude of 14,440 feet above tide water. The famous and beautiful Bear Creek Falls are two miles south of the town, and near them is the wonderful piece of toll-road, cut in walls of perpendicular quartzite. All about the neighborhood are rich mines of gold and silver. There are also many other natural features of interest, including caves, waterfalls, cañons, peaks, lakes, and gorges, reached by good roads or mountain trails. The climatic conditions about Ouray are quite unexceptionable, sunshine being the rule, with warm and pleasant days during the summer, followed by cool, refreshing nights. The highest summer temperature is about 90° F., and the lowest winter

minimum 5° F.; but owing to the rarity and dryness of the atmosphere, these extremes represent much less variation than in most localities of the East. The number of springs in the town limits is estimated at more than one hundred, the temperature of their waters ranging from 130° to 140° F. No analysis has been made, but we are informed by the proprietor of a number of the springs that the waters contain lime, soda, manganese, and iron, and some of them sulphur. Two bath-houses have been fitted up, and are much resorted to in the treatment of rheumatic affections. It is said that the internal use of the waters has been found beneficial in cases of dyspepsia, indigestion, constipation, and blood and skin disorders. The town of Ouray has about twenty-five hundred permanent inhabitants, and is well supplied with pure and wholesome water from mountain springs by water works constructed on the gravity plan. The city possesses a complete system of sewerage, and is always in a clean and healthful condition. The climate is said to be very beneficial to persons suffering from bronchial and pulmonary troubles.

James K. Crook.

OVARIES, DISEASES OF.—The ovaries are two small ovoid or rounded bodies, one of which is attached to the posterior surface of the broad ligament just internal to and below the fimbriated extremity of each Fallopian tube. They are of a pinkish color and vary in size and shape, even in health, without being actually malformed.

The average measurements are: Length, 30-50 mm.; breadth, 15-30 mm.; and thickness, about 12 mm. Ovaries greatly exceeding the above in size are rarely met with, but Altoukhov reported before the members of the Moscow Obstetrical and Gynecological Society the case of a patient whose right ovary measured 35 × 13 × 7 mm., and the left one 80 × 14 × 6 mm., and at the same time mentioned a patient of Nega's in whom the left ovary was 54 and the right 108 mm. in length. In the latter case the uterus was infantile and the patient a pronounced nymphomaniac; but whether or not the enlarged ovary caused the nymphomania it is very hard to say. Probably excessive irritation of the vulva caused the hypertrophy of the ovary.

The function of the ovaries of producing and discharging ova has long been known, but of late they have been credited with producing an internal secretion which alleviates or prevents the troubles of the menopause.

ABSENCE OF OVARIES.—One or both ovaries may be congenitally absent. When both are wanting there is usually a lack of development of the mammae and other sexual organs, and when only one is missing the corresponding side of the uterus is poorly developed. When a woman has absolute amenorrhœa, without any molimina, and sterility, you may suspect that she has no ovaries; but as long as one ovary and tube are present maternity and menstruation will likely go on undisturbed. The only way to make sure about the presence or absence of both sets of appendages is to open the abdomen and explore the pelvic cavity.

TRANSPLANTATION OF OVARIES.—On account of the serious results, matrimonially and otherwise, of the absence of both ovaries, either congenitally or as a result of operation, the procedure of transplanting ovaries is of considerable interest. J. Lankashevitch interchanged ovaries between rabbits, dogs, etc. The operations were carried out with the strictest aseptic precautions. Each ovary was removed along with its mesentery, the cut edge of which was attached to the broad ligament of the new host near the spot from which the corresponding ovary had been taken, but sufficiently far from the cornu of the uterus to avoid compression. In a few instances, however, the ovary was fastened to either the mesentery or the peritoneum of the abdominal wall; the sutures used were fine silk and were placed very close together.

The only dog used was killed nine months after operation, and the transplanted ovary was found firmly adherent in its new situation, and to be but slightly diminished in size. Capillaries and muscular tissue ran from

the ovary to the subjacent tissue. Germinal epithelium was seen in places and a few normal follicles lay in the cortex side by side with others which had undergone atrophic change. Yellow areas of degenerated tissue were scattered here and there throughout the organ. In the case of animals which were killed two or three years after operation, the large ovaries remained, whereas the smaller ones had almost entirely disappeared; and in the latter case the genitals also had become atrophied if the animal's own ovaries had been removed. Conversely, it may be stated that the transplantation of large (*i. e.*, from large animals) ovaries exerts an inhibitory action upon the atrophy of the genitalia, and also upon the deposit of fat in the pelvis which usually accompanies the menopause.

B. A. Katsch has also investigated this subject, and practically obtained similar results to the above.

The ages of the animals from which the ovaries are taken have an important bearing upon the result as regards rapidity of regeneration of the follicles, etc., this rapidity of regeneration being inversely proportional to their age. When the ovaries are first implanted their tissues tend to degenerate to some extent in the following order, viz., connective tissue, germinative tissue and its derivatives, and lastly, the medullary layers, the Graafian follicles undergoing a change similar to that which occurs at the menopause. Their death takes place centripetally, but they may become regenerated from the germinal epithelium. When this rejuvenescence of the ovaries, as one might call it, does not take place, the genitals atrophy.

In none of the animals operated upon did pregnancy follow, although ample opportunity for this to take place was given.

The conclusions to be drawn from the consideration of the above facts are: (a) Ovaries can be transplanted from one animal to another; (b) ovaries from the carnivora will take the place of those of herbivora and *vice versa*; and (c) the transplanted organs flourish and partially functionate. These reported results open up visions of the practicability of performing the same operations upon women, but the field of feasibility would necessarily be very limited by the difficulty of obtaining absolutely healthy ovaries to transplant, as well as for other reasons which it is unnecessary to mention.

R. T. Morris adds as further proof of the possibilities of this operation that the occurrence of pregnancy after oöphorectomy is due in many cases to the transplantation of portions of the ovary. As early as 1895 Morris began ovarian grafting in the human being, having had twelve cases up to 1901. He places the ovary in normal saline solution at a temperature of 100° F. In his early cases he made a slit in the fundus of the uterus and placed the ovary in it, but in his more recent ones the ovary was attached to the broad ligament as near the seat of attachment of the patient's own ovary as possible. The result thus gained is the avoidance of a premature menopause, thus showing that the ovarian graft has retained its vitality. In one case pregnancy resulted, but an early abortion occurred.

ACCESSORY OR THIRD OVARIES.—These have been described, but were probably merely pieces of an ordinary ovary, which had become separated from the rest of the organ by fissures. It is significant that during the thousands of coeliotomies which have been performed of late years, no competent observer has definitely reported a case in which more than two ovaries have been found in any one patient.

DISPLACEMENTS OF THE OVARY.—While the ovaries are developed in the abdomen they usually descend into the pelvis, but now and then one or both fail to do so and remain at the level of the pelvic brim. This malposition, however, gives rise to no symptoms, but will prevent the physician from feeling the organ during an ordinary bimanual examination. It may be diagnosed by not discovering the ovary in its usual place, or in thin subjects by feeling it at the pelvic brim during deep abdominal palpation.

HERNIA.—A more important form of displacement, on

account of the discomfort to which it may give rise, is hernia of the ovary. Here it descends along the round ligament and lies in the sac of an ordinary inguinal hernia, or it may lie in one of the labia majora, or even form part of a femoral or obturator hernia. In addition to the usual symptoms of a hernia, one gets an exacerbation of pain at the menstrual period and also an increase in size and tenderness at the same time. Pressure gives rise to a peculiar nauseating pain, which is almost pathognomonic of pressure on either an ovary or a testicle.

Treatment.—If in a position in which it is subjected to much irritation or pressure, the ovary may be protected by a cap or pad; but if these fail, it may be removed by an ordinary herniotomy operation.

PROLAPSES OF THE OVARY.—In health the ovary lies to one side of the uterus, at the level of or slightly below the fundus. In certain conditions, however, it falls considerably below that level, at which time the position may be considered to be pathological. It is due to a reposition of the fundus dragging it out of place, or to adhesions due to an old pelvic peritonitis, acting in a similar manner. A general want of tone of the parts or prolonged ovarian congestion will also cause the ovary to become prolapsed. Other causes of this condition are sudden strains or any enlargement of the organ.

The symptoms are caused by the congestion consequent upon the displacement of the organ and by the disturbance of and pressure upon it by the distended bladder or rectum, and the various movements of the pelvic muscles. These all cause a dragging, aching pain in the pelvis, which is exaggerated at the onset of the menstrual congestion. More or less severe paroxysms of pain are caused by coitus and the passage of hard fecal matter along the rectum.

When the organ is not embedded in adhesions, the diagnosis of a prolapsed ovary is comparatively easy. On making a vaginal examination a tender ovoid, mobile body is to be felt, either low down behind the uterus or in one or other lateral region of the pelvis.

The treatment consists in finding and removing the cause wherever possible. If the uterus is prolapsed or retroverted, restore it to its normal position, and keep it there by tampons or a pessary. If there is a general want of tonicity in the parts, try to improve the condition by hot douching, local counter-irritation per vaginam, and the insertion of a boroglyceride or glyceride of tannic-acid tampon, as well as by the local use of electricity, especially faradic. The bowels should be kept regular, and gentle exercise (walking) be encouraged. Some writers advocate pelvic massage for this condition, and claim to have obtained striking results from this line of treatment. It is questionable, however, if the doubtful good obtained is not entirely eclipsed by the ill effects which the necessarily prolonged handling of the genitals produces.

When the ovary is adherent, and the above treatment fails to relieve the pain, etc., an operation will be required. The indication will then be to separate the adhesions and possibly stitch the ovary in a more favorable position on the broad ligament. In order to prevent the formation of fresh adhesions the raw surfaces may be covered with Cargile's animal membrane or with a small portion of omentum, which may be cut off and carefully sutured over them. The abdominal route is the one recommended for this operation, as you are able to expose the parts thoroughly, and treat any small pockets of pus which are so apt to be present in old cases of pelvic peritonitis. You can also stitch the ovary in place better by the abdominal than by the vaginal route.

ATROPHIC DISTURBANCES.—Atrophy of the ovary may be physiological (as when it follows the menopause) or pathological. Pathological atrophy is apt to accompany excessive obesity, while prolonged pressure by adhesions or tumor, interference with the vascular supply and removal of the uterus, are also causes of this condition. It is also said to follow alcoholism, acute exanthemata, rheumatism, etc., but the condition then is not one of true atrophy but of cirrhosis.

In cirrhosis of the ovary there is an increase in the fibrous tissue of the organ at the expense of the glandular and muscular elements. In the early stages the ovary is of normal size, but is firmer than usual; while later it is small and very hard, its surface is glistening white and thrown into brain-like convolutions by contraction of the fibrous tissues.

The symptoms are pain, sterility, and various reflex neuroses, the patient often complaining of gastric disturbance, visual defects, and headache. The pain is usually related to menstruation, or is of a peculiar dull sickening nature, coming on from ten days to two weeks before the onset of the flow. Local examination of the pelvis is not apt to reveal very much, as the ovaries are too small to be felt except in particularly favorable cases, when they are felt to be very hard, painful, and small.

In the way of treatment, not much can be done, although in the earlier stages electricity may possibly check the condition. When fully established, however, oöphorectomy is indicated.

The etiology of the condition is unknown.

HYPERTROPHY.—This is caused by anything which produces chronic congestion, or by any inflammatory process which stops short of the formation of pus. As examples of those causing congestion may be cited chronic constipation, prolapsus ovarii, too frequent coitus, etc. Pure hypertrophy, however, is where there is an increase of all of the constituent parts of the ovary, and is extremely rare, the above conditions being much more likely to be followed by cystic or fibrous enlargement than by true hypertrophy.

The symptoms of hypertrophy of the ovary *per se* are practically nil, but will be those of the condition giving rise to it; consequently no treatment is necessary.

INFLAMMATION OF THE OVARY.—In the ovary, as elsewhere, congestion is an early stage of inflammation. Just as in other regions, it has its own symptoms and may be checked without going further.

The causes of congestion are exposure to cold, especially during menstruation; chronic constipation, in which case the left ovary is the one chiefly affected, owing to its proximity to the rectum; excessive sexual excitement, prolapse of the ovary, inflammation of neighboring structures, bacterial toxins or germs (invasion by the latter rarely stops short of producing pus), and twisting of the pedicle of the ovary. Sometimes the removal of one ovary produces an hypertrophy of the other, which, as a rule, is transitory. It may, however, go on to chronic inflammation and cystic formation; but if promptly, properly, and patiently treated by rest, hot douches, and boroglyceride tampons, the congestion should subside in a few months' time. One can readily understand how disappointed a patient is when the removal of one ovary has simply resulted in the transference of her pain to the opposite side. She will often blame the operator for not having removed both ovaries, and want him to perform a second oöphorectomy; but if he is firm in his refusal to do so until a more or less prolonged course of local treatment has been tried, both he and his patient will time and again be rewarded by the return of the diseased ovary to health and usefulness.

Besides the above pathological forms of congestion a physiological variety occurs during menstruation, pregnancy, and sexual excitement, but this does not require consideration in this article.

Oöphoritis, or inflammation of the ovary, may be either acute or chronic, the former usually passing on to the chronic variety if untreated, and if the infection is not sufficiently acute to carry off the patient before the affection reaches the chronic stage.

Acute oöphoritis is practically always caused by the presence of germs. These may be carried to the organ by the blood or lymph vessels from some more or less remote source of infection, or else may attack it by a more direct route, as where there is an acute infectious inflammation of the Fallopian tube, or where the ovary is adherent to the rectum, appendix, or other portion of the bowel, and the germs reach it from thence.

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The two most common forms of infection are gonorrhoea and puerperal septicæmia, both of which may cause a most severe disease. In addition to these, however, acute inflammation may be set up by injury, by poisons, such as arsenic and phosphorus, by the acute exanthemata, mumps, acute rheumatism, etc. The writer, some years ago, saw a woman who was suffering from an ordinary attack of typhoid fever; she was quite suddenly seized by a sharp pain in the region of the right ovary, the pulse became more rapid and the temperature rose. Appendicitis and perforation of the bowel having been excluded, the abdomen was opened and the right ovary was found to be enlarged and acutely inflamed. The removal of the organ was followed by relief of all pain, with ultimate recovery of the patient.

Symptoms.—The patient suffers from an acute agonizing pain in one or other ovarian region, the pain radiating up toward the umbilicus into the loin, down the leg, etc. More or less nausea is present. Defecation and micturition are frequently painful. Examination of the lower abdomen reveals great tenderness over the affected region, and the same will be found per vaginam, by which passage also one can feel the ovary to be somewhat enlarged if the parts are not too tender.

Treatment.—Absolute rest in bed is distinctly indicated, as is also the application of ice, or, if that fails, heat, over the lower abdomen. The parts may be too tender to allow of hot douches being used, but they usually give great relief. The water ought to be as hot as the patient can possibly stand it, and at least one gallon should be used. The force of the water may be regulated by the height of the douche pail above the patient's bed, and ought not to be too strong. Lavage of the rectum is often of service, especially when the left ovary is the one affected. Blistering the abdomen over the diseased area will often be of service.

The tincture of aconite, given in doses of one or two drops every hour, often benefits the condition by quieting the circulation, but there is no drug which has any specific action upon the malady. The bowels should be well emptied early in the attack and then kept at rest. The best way to influence them is by sulphate of magnesia in drachm doses every hour for five or six hours; the drug being dissolved in hot water. After this has taken effect keep the bowels closed by tinctura opii, or by a pill plumbi cum opio. As regards diet, it should be fluid, light, and non-stimulating, consisting principally of milk and its preparations.

Prognosis.—If the patient is seen in time and if the infection is not too virulent, the above treatment suffices to cure the vast majority of cases. But the disease may pass into the chronic variety, or else an abscess may be formed. This abscess if not interfered with may either resolve, remain quiescent, or rupture. If the organ has become adherent to either the bladder or the bowel, it may rupture into them and its contents be discharged externally. Otherwise it will rupture into the general peritoneal cavity, causing acute inflammation of its lining membrane and the death of the patient. After the escape of the contents through either the bladder or the rectum the sac may refill, and should then be removed by the surgeon; in fact, when an abscess of the ovary exists which will not yield to milder measures, the surgeon must interfere. It is better if he can wait until the virulence of the germs is lessened, as this greatly reduces the risk of the operation and occurs within a few weeks, probably not more than five or six.

Diagnosis.—This is sometimes a matter of great difficulty and importance. The conditions with which it is most likely to be confused are: (a) appendicitis (when the right ovary is attacked); (b) intussusception; and (c) pelvic tumor with a twisted pedicle.

In appendicitis the pulse and temperature are more liable to be interfered with, there is more vomiting, the tenderness is higher in the abdomen, and it is more than probable that a vaginal examination will give a negative result, whereas in acute oöphoritis the examining finger will probably feel the diseased ovary.

Intussusception rarely occurs in adults. It gives rise

to a sausage-shaped tumor, and either to complete constipation or to bloody and mucoid stools.

A tumor with a twisted pedicle makes itself evident either to sight or touch, if not to both. An ovary enlarged by an abscess would give a more chronic history, *i. e.*, it would not give rise to the sudden acute pain which torsion of a pedicle causes.

Chronic Oöphoritis is much more common than the acute form which it may follow. It frequently, however, comes on quite independently of the acute variety, and is much more insidious in its onset. Women are most liable to it during the period of greatest sexual activity, from which statement it may be correctly inferred that it is much more common among married than among single women. Excessive sexual excitement, especially without gratification of the desires, is one of the commonest causes of this condition. In addition to this, mumps, masturbation, operations upon the cervix (?), and prolonged congestion of the ovary are prolific causes.

Pathology.—When an ovary which is the seat of chronic inflammation is examined, it is found to be somewhat enlarged, and to contain more or less numerous small cysts. The organ is firm, and its peritoneal covering is tough and thickened. There is also an increase in the fibrous tissue.

Symptoms.—Chronic inflammation of the ovary produces pain in one or both sides of the pelvis, according as to whether or not one or both ovaries are affected. When the disease is unilateral, the left is the one usually the seat of the trouble on account of the proximity of the rectum. This pain may radiate down the thighs, across the abdomen, or up toward the umbilicus, and is aggravated by defecation, by any sudden movement, as on taking a jump or misstep, by jolting, coitus, etc. It also becomes more marked a week or ten days before the menstrual flow appears, being relieved by the local depletion which is thus caused, in proportion to the amount of blood lost. A sharp pain in either one or both breasts, and especially in the left, is often experienced. Pressure through the abdomen over the diseased organ causes pain, as does also coitus. On making a local vaginal, or, better, rectal examination of the pelvis, the ovary is felt to be enlarged, tender, and often more or less prolapsed.

The *diagnosis* is not difficult as a rule. The location, in the ovarian region, of a pain which becomes more severe several days before menstruation; the reflex mammary pain; painful defecation and the presence of an ovoid tender mass in the region usually occupied by the ovary, will point strongly to chronic inflammation of the ovary. Of course the inflamed organ may be plastered against the pelvic wall by adhesions, in which case you will have to be guided by symptoms alone.

Treatment.—This consists in finding and removing the cause wherever this is possible. Regulate the bowels and diet and limit the patient's exercise. This may require to be entirely prohibited in obstinate cases, the patient being confined to bed. Stop excesses of all kinds, whether bacchanalian, gastronomic, or sexual. The domestic duty most likely to aggravate, or at all events keep up the trouble, is working the treadle of the sewing-machine, which should be strictly forbidden. Depletion of the pelvis may be effected by accelerating the action of the bowels by means of sulphate of magnesia or one of the many aperient waters, by hot douching, by hip baths, by medicated tampons, or by vaginal cones or bougies. For the douchings plain boiled water cannot be improved upon, but it must be used in quantities of not less than a gallon, and must be as hot as the patient can possibly bear it. The vagina, not being a very sensitive organ, can tolerate a much higher temperature than the skin of the perineum and vulva, but these parts may be protected by a towel wrung out of warm water. The tampons are better if they are made small, about the size of a large walnut, using two or more if necessary. They will thus fit more snugly and cause the patient less discomfort than if a single large one is used. While tampons saturated with boroglyceride or pure glycerin are useful, the em-

ployment of a ten-per-cent. solution of ichthyol in glycerin, or a combination of ichthyol, tincture of iodine, glycerite of hydrastis, and boroglyceride is to be preferred. Counter-irritation through the skin of the abdomen, or per vaginam, is a valuable adjunct to the above course of treatment. The first may be carried out by painting the skin of the abdomen with the tincture of iodine, or blisters may be employed. When these are used a small blister should be placed over the centre of the painful area. When this one heals a second is to be placed at its side, and so on until the first one has been completely surrounded; each one being allowed to heal before applying the next. The counter-irritation per vaginam is best effected by painting the lateral fornices with a mixture of equal parts of the liniment and tincture of iodine.

Little can be done in the way of internal medication for this condition. The bromides, especially a combination of those of ammonium and sodium, have been highly commended and may be of some use in quieting the circulation and pain. The chlorides of gold and sodium have also been employed with benefit. Temporary exacerbations of pain must be combated by the local application of heat and the administration, by the medical attendant himself, of morphine. Alcohol should be absolutely forbidden as it only aggravates the condition eventually, although it may relieve the pain for the time being.

The above line of treatment ought to be conscientiously persisted in for many months before abandoning it as useless—that is to say, when the woman can give up the time for it. When she cannot do this, and it is necessary to cure her quickly so that she may return to her ordinary sphere of usefulness in a comparatively short time, as also in those cases in which all non-operative means have failed, removal of the offending organ is the only resource left. This may be done per viam abdominalem or per vaginam, but this operation will be fully described in another article. (*Cf. Ovariectomy.*)

Hæmatoma of the Ovary.—During the course of acute fevers, as a result of injury or pressure upon or torsion of the broad ligament containing the ovarian vessels, one of the capillaries within the stroma of the ovary or wall of a Graafian follicle may rupture and give rise to a collection of blood, which is called an hæmatoma ovarii. It may also be caused by the impregnation and rupture of an ovum in the ovary, the possibility of the occurrence of which has been but recently demonstrated. Hæmatoma of the ovary is not at all uncommon, but is rarely of any clinical significance. On inspection the ovary is seen to have a larger or smaller bluish-red mass projecting from its surface, which mass is semifluctuating. Microscopic examination reveals a mass of blood clot lying within a more or less well-formed capsule.

Ovarian hæmatoma rarely gives rise to any symptoms or calls for any treatment. If symptoms are present they are usually those of chronic ovaritis and call for the same treatment, except that where operation is indicated nothing should be removed but the diseased portion of the ovary.

OVARIAN PREGNANCY.—In Clifford Allbutt's "System of Medicine," published as recently as in 1896, the writer on "Diseases of the Ovaries" says: "It is extraordinary that belief in the occurrence of ovarian pregnancy should have obtained currency," and that "until some specimen is forthcoming in which an early embryo in its membranes can be demonstrated in a sac inside the ovary, we need not trouble ourselves to discuss ovarian pregnancy." Only three years later Croft and van Tussenbroch each reported an undoubted case, and since then at least three other cases have come to light, *viz.*, those of Anning and Littlewood in 1901, Mayo Robson in 1902, and Thompson in 1902. It is a curious fact that of the five cases no less than three occurred in Leeds, England.

Symptoms.—Ovarian pregnancy gives rise to very much the same symptoms as those of ordinary tubal gestation, except that, as a rule, rupture is not preceded by the dull aching pain in the side, to which the latter gives rise. The absence of this pain may be ascribed to earlier rup-

ture and to there being no firm muscular fibrous tube wall to distend.

The patient passes her time by a week or ten days, or else her last period has been replaced by a dribbling of blood which has persisted. This is followed by a sudden sharp pain in one ovarian region, accompanied by faintness, with possibly actual loss of consciousness, by sighing respirations, pallor, a cold clammy sweat, and rapid thready pulse. Although the temperature is usually subnormal, some elevation of it is quite compatible with the condition, as was recently seen in a case which the writer had under his care in the Montreal General Hospital.

On examining the patient the surgeon will find some tenderness over the affected organ, slight dulness in the flanks, and the seat of the effused blood will be warmer than the rest of the abdomen. Attention was first drawn to this sign by Grandin, and while it cannot be always distinguished, the writer has seen it in at least one case since the publication of Grandin's paper. Vaginal examination will reveal an oozing of blood from the vagina, a softened velvety cervix, normal uterus, and a rather vague mass in one fornix.

The *etiology* is still *sub judice*. As shown by the fact of only five undoubted cases having been reported, pregnancy occurring in the ovary is extremely rare; but it is quite possible that many of the cases of hæmatoma of the ovary which have been reported have really been cases of ovarian pregnancy, it being probable that villi and other signs of gestation would have been observed if they had been carefully searched for. On the other hand, it is almost certain that many of the older cases of reported ovarian gestation have really been nothing more than hæmatomata, as proved by microscopic examination. In order to be certain that the gestation is ovarian, it must be shown that the original attachment is inside the ovisac, and that the ovum derives its nourishment from thence. This can be done with certainty only in the very earliest weeks of pregnancy, as the ovarian tissue is liable to become so displaced in cases of tubo-ovarian pregnancy as to appear to have been the original seat of implantation of the ovum. In a true ovarian gestation the ovum immediately upon impregnation attaches itself to the wall of the ovisac; villi are thrust into this wall, and by this means the ovum is nourished. In the majority of cases the ovum continues to grow until between the fifth and sixth week, at which time it ruptures into the peritoneal cavity. This is followed by severe intraperitoneal hemorrhage, although, judging from the small numbers and size of the vessels, one would not expect such a result. In at least two of the fully reported cases the abdomen was found to be filled with blood at the time of operation.

Treatment.—This will vary according as to whether or not hemorrhage has ceased and the patient can be kept under observation and constant readiness for operation, and also whether or not the clot is undergoing absorption. If seen some time after rupture has taken place and if the patient can be kept under close observation, temporizing measures may be adopted. In such a case one of the most important points to be remembered is that all cardiac stimulants are absolutely contraindicated, as their exhibition is very liable so to increase the force of the heart's action that the clots, which are plugging the mouths of the ruptured vessels, will be forced out and a fresh hemorrhage take place. The very best way to improve the patient's condition is to use decinormal saline solution, either per rectum, or subcutaneously, or intravenously, according to the acuteness of the symptoms. It is only in the most urgent cases that the latter method is required, as the solution is very quickly absorbed from either the bowel or the submammary region. Absolute quiet and rest in bed are strongly indicated, and the circulation and pain may be calmed by the subcutaneous injection of morphine. Ice should be applied to the abdomen over the point of rupture, and hot vaginal douches may be begun some days after cessation of the bleeding. The diet should be nutritious but non-stimulating.

Where under this treatment the clot does not become absorbed within a reasonable time, it may be cleared out by means of an incision through the posterior vaginal wall.

When the patient is seen soon after rupture, or when she cannot be kept under observation, the quicker the abdomen is entered, the bleeding controlled, and the gestation removed, the better it will be for the patient, shock or no shock. This condition of shock is to a very great extent due to loss of blood, and will not be lessened by allowing this to proceed. While some few of these patients will recover without operation, a much larger percentage of recoveries will take place if the knife is used early, energetically, and judiciously.

TUBERCULOSIS OF THE OVARY.—Tuberculosis of the ovary is extremely rare, the ovary being only the third in order of frequency of the female genitals to be affected. In fact so rare is the disease that the older writers did not deem it worthy of consideration in their works. The rarity and almost impossibility of occurrence of primary ovarian tuberculosis can be readily understood when one realizes that in order to have such a condition the bacilli would require to enter the body from the exterior and then traverse a more or less complicated system of blood-vessels or lymphatics before entering the ovary. No case of primary tuberculosis of the ovary in the human subject has yet been reported. Although Acconi experimentally produced it in animals, Spaeth, Blebs, Oppenheimer, Sippel, and others have recorded cases in which the ovary was the only genital organ to show the disease in patients who were otherwise tuberculous. In the majority of cases it was the superficial part of the organ which was the seat of the disease, the presence of which in the deeper layers was frequently unsuspected until the ovary was examined under the microscope.

The form of tuberculosis present is the miliary form, and it may affect either the superficial or the deep layers. When the latter part is affected, the disease is apt to proceed until an abscess is formed, and this may rupture into the peritoneal cavity. The germs may reach the ovary either through the blood or the lymph current by direct continuity, as in the case of tuberculosis of the peritoneum or tubes, or by bacilli working their way through a weak spot in the bowel wall and falling upon and infecting the ovary.

No age is exempt from this disease, but those under fifty are the most liable to be attacked. Out of 17 cases reported by Griffith 5 were under fourteen, 8 were between fourteen and twenty-five, 3 between twenty-five and forty-five, and 1 was fifty-five years of age.

The *clinical history* is very vague and there is no symptom or series of symptoms which can be considered to be at all pathognomonic of this condition. There may be absolutely no symptoms or else those described as occurring in chronic oöphoritis may be present. Where such is the case and you have a semifluctuating, rounded, non-sensitive mass occupying the region of the ovary, together with an evening rise of temperature, in a young woman who is otherwise fairly healthy, and who has not been exposed to the two common causes of pelvic abscess, *viz.*, gonorrhœa and sepsis, you may suspect the presence of a tuberculous abscess of the ovary. Anything short of abscess formation cannot be definitely diagnosed previous to operation, as both physical signs and symptoms are too indefinite. Menstruation may or may not be affected, but when it is interfered with amenorrhœa is the form usually taken, and is more the result of the general than it is of the local condition.

Once diagnosed the only *treatment* to be adopted is removal, but this can be advocated only in the absence of extensive disease of other organs.

TUMORS OF THE OVARY.—The ovary itself may be divided into the oöphoron which contains the ova, and the paraöphoron or part nearest the ovary. Although this latter is anatomically quite distinct, it might be considered clinically to be part of the ovary. Of these three parts, the oöphoron is the most active as far as the formation of tumors is concerned. From it are derived: 1.