G. *Infantile Vagina.*—Sometimes the vagina, though perfectly developed, from an arrest of growth in childhood, fails to attain adequate dimensions, and retains its infantile character throughout later life, being too short, too narrow, or both. Uterus fœtalis and uterus infantilis are not infrequently associated with this condition.

George Woodruff Johnston.

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VAGINA, DISEASES OF.—I. Cysts.—Cysts of the vagina are not met with very frequently. Usually they are located in the lower third of the vagina and occur with equal frequency upon either the anterior or the posterior wall. When deep-seated they are small and do not encroach much upon the lumen of the vagina, but as they increase in size the vaginal mucous membrane becomes distended, loses its characteristic wrinkles and assumes the appearance of an ovarian tumor, especially when it protrudes at the vulva. As a rule they grow slowly and rarely attain a great size. These cysts may be of glandular origin or may have their origin in the remains of the Wolffian bodies. In those cases in which several cysts are found connected in a row at the side of the vagina they have doubtless originated in local dilatations either of one of Gärtner's ducts or of an undeveloped duct of Müller. The contents of the cysts are usually a clear yellowish transparent fluid, but they may be discolored by disorganized blood which has escaped into them. They rarely give any symptoms beyond that of mechanical obstruction. It is well to remember, in making a diagnosis, that these cysts have been mistaken for cystocele, rectocele, urethrocele, vaginal hernia, and cysts of the vulvo-vaginal gland. In all cases of vaginal cyst it is best to remove them except in old women in whom the tumor is small. They may be punctured and drained, or injected with some irritating fluid to set up an obliterating inflammation, or they may be dissected out. The last sometimes proves a most tedious and difficult procedure. Schroeder's operation consists in removing by scissors all of the cyst wall that rises above the level of the vagina and

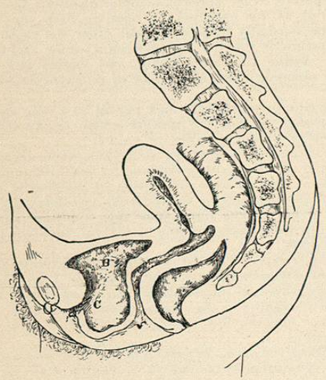

Fig. 4941.—Diagrammatic Representation of Combined Cystocele and Urethrocele. (From Mundé's "Gynæcology.")

stitching the mucous membrane of the vagina about the circumference of the excavation to the cyst wall. The surface occupied by the remainder of the cyst soon assumes the character of the vaginal mucous membrane, the cavity becomes flattened out, and no trace of the tumor remains. In this connection it may be well to mention the fact that large blebs are sometimes found in the va-

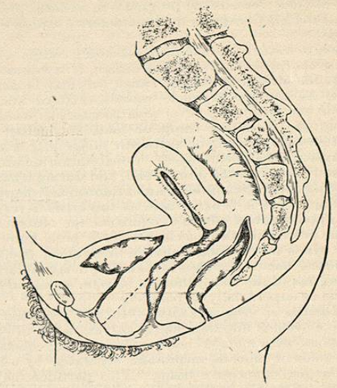

Fig. 4942.—Diagram showing Hypertrophy of the Tissues below the Urethra. (From Mundé's "Gynæcology.")

gina, and have been named by some authorities air cysts of the vagina. They are usually found in the upper portion of the canal. They collapse on puncture or they rupture and disappear. They are more apt to be present during gestation than at any other period.

II. New Growths.—Carcinoma has been known to develop primarily in the vagina, but as a rule the only malignant growths observed in the vagina are those which have developed primarily in the uterus. For information in regard to them the reader is referred to the article entitled *Uterus, Diseases of: Malignant New Growths.*

III. Vesico-vaginal Cystocele.—Cystocele is a descent or prolapse of the base of the bladder into the vagina, and declares itself by the presence of a protruding mass at the introitus vaginæ. It varies in size from a small ovoid to a large mass protruding entirely out of the vulva (Fig. 4941). Under the latter circumstances it is usually accompanied by procidentia of the uterus and prolapse of the rectum. A cystocele partakes of the character of a true hernia, and in its ordinary form must be regarded as a hernia of the bladder which protrudes into the vaginal canal and presents itself at the vulva. The symptoms which are steadily progressive are dysuria, retention, and incontinence due to overdistention. Later, there may follow cystitis, ureteritis, pyelitis, rarely a vesical calculus. The etiology of the condition varies in different periods of life. In virgins and nulliparæ it is due to a supravaginal elongation of the cervix, occasioned primarily by hypertrophy of the uterine tissue. This permits the descent of the upper supports of the vagina, producing a sagging of its anterior wall and the base of the bladder. This initial elongation pushes down the vaginal supports; but later the rôles are reversed and the vaginal prolapse drags down and increases the elongation of the cervix. In multiparæ the condition is usually associated with laceration of the cervix and perineum, with retrodisplacement and descent of the uterus. In the process of parturition the anterior vaginal wall, as well as the other parts, has suffered serious injury, reducing its resisting power and permitting the development of the hernial pouch into which the bladder descends. The diagnosis of the condition is not difficult. A protruding mass presents itself at the vulva; it is soft and flabby when the bladder is empty, tense and elastic

when the bladder is full. A sound passed through the urethra readily turns down into the protruding tumor, and by means of this the boundaries of the bladder may be readily determined.

The condition of urethrocele must be distinguished from that of hypertrophy of the tissues which lie below the urethra. This latter condition is by no means uncommon (see Fig. 4942).

Treatment.—In aged women in whom an operative procedure is not advisable on account of the dangers of anæsthesia, shock, and depression, a pessary can usually be fitted to retain the mass in the vagina and thus afford relief. The Gehrung hard-rubber pessary has been found most serviceable for this purpose. A soft-rubber ball that can be inflated after insertion is effective, but requires constant attention and frequent renewals. Such devices are merely temporary expedients. For permanent relief some operative procedure must be resorted to. Sims and Emmet were very ingenious in devising different methods of plastic work upon the vaginal wall, and they carried these methods to a high degree of perfection.

The fundamental idea in these methods was to denude areas of various sizes and shapes in the mucous membrane of the vagina, and then to cover them over by introducing sutures into the surrounding edges of the mucous membrane and drawing upon them until all the slack over the hernial mass had been taken in. These operations took the name of *colporrhaphy.* The stitches were usually passed in a transverse direction. Stoltz simplified this by merely denuding an oval or round area of mucous membrane, the size varying with the size of the cystocele, and then drawing the edges together with a puckering string, which had been passed around the circumference of the denuded area, about one-third of an inch from the edge. This string was worked in and out of the mucous membrane, like the gathering string of a tobacco pouch. All of these operations, however, failed to give permanent relief. Sooner or later the steady pressure caused the contracted tissue to stretch and eventually to give way, and thus the original condition was reproduced. The true cause of the difficulty was not overcome by these methods.

If it be granted that a cystocele is a hernia, it would seem quite as rational a procedure, and would give promise of quite as satisfactory results, to denude the skin over an inguinal hernia and bring the edges together with stitches, as to expect to cure a cystocele by simply denuding the vaginal mucous membrane and covering in the raw surface. The fascia is the sustaining tissue in all herniæ, and the only permanent relief consists in cutting out the overdistended and atrophied area of fascia and bringing into apposition the edges of the strong, well-nourished areas that have either resisted, or have not been subjected to, the destructive pressure. In the relief of cystocele, however, the bladder does not adapt itself to the new condition so readily as the intestines do after an operation for inguinal hernia. The base of the bladder, by reason of the diminution in the extent of the vaginal wall, is thrown into wrinkles and folds, producing pockets in which the urine may accumulate, be retained, undergo decomposition, and inaugurate the unfortunate sequelæ of cystitis, calculus, ureteritis, pyelitis, etc. Some way must be provided, therefore, for smoothing out the redundant tissue of the bladder wall produced by the operation upon the fascia. This is all accomplished in the author's procedure, as follows:

The Author's Operation for Cystocele.—This device has for its object the attainment of two distinct results: First, to free the wall of the bladder from all connection with the vagina, as the contents of an inguinal hernia are freed from the sac, so that all of the overstretched vaginal sheath or fascia, and vaginal mucous membrane as well, may be cut away and the well-nourished areas secured for support of the bladder; and, second, to smooth out the redundant base of the bladder produced by thus diminishing the size of its capsule. The technique of the operation is as follows: A transverse incision is made through the vaginal wall just in front of the cervix, as for vaginal hysterectomy. Through this the bladder is dissected from the uterus and the peritoneal cavity entered, the peritoneum being torn well out to either side. A longitudinal incision is then made in the anterior vaginal wall from the middle point of the transverse incision to the neck of the bladder. Through this the bladder wall is freely dissected from the vaginal wall on either side until its base is set entirely free. The bladder is now rotated upon its transverse axis, the base being carried up against the face of the uterus and stitched there with chromicized catgut. In doing this the surgeon should select, in the base of the bladder, a point so situated that by stitching this particular part of the bladder to the uterus he will cause all the slack between the latter organ and the symphysis pubis to disappear. He should next select, on the sides of the bladder, two other points equally distant from the median line and on the same level with the points first selected, and by means of sutures he should firmly attach these two parts of the bladder-wall to the torn edges of the peritoneum on the face of the broad ligaments. In doing this, however, he should be careful to insert the sutures into each broad ligament at points far enough removed from the median line to cause them, when tied, to take in all the slack in the base of the bladder from side to side. The effect of this mode of employing sutures is to

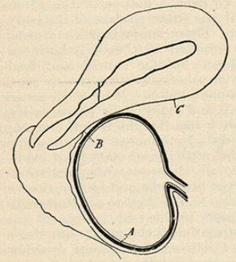

Fig. 4943.

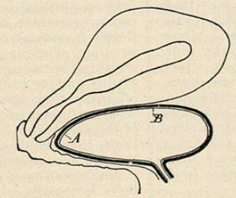

Fig. 4944.

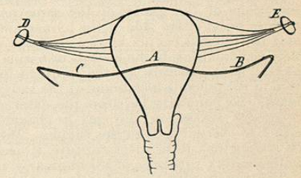

Fig. 4945.

Figs. 4943, 4944, and 4945.—Diagram showing some of the Details of the Author's Operation for the Relief of a Vesico-Vaginal Cystocele, and the Principle upon which it is Based. Fig. 4943 shows the position of the bladder and its relations to the uterus before the operation. After the bladder has been freed from its sheath, it is rotated on its transverse diameter until the point *A* is carried up to *B*, and the point *B* to *C*. The effect of this is shown in Fig. 4944. The bladder is then stitched in its new position, in which its base (from *A* to the urethra) forms a straight line. In Fig. 4945 the line *A B C* corresponds with that of the tear through the peritoneum across the face of the uterus and broad ligaments, *C* and *B* being the points at which the corners of the bladder are attached on either side; *D* and *E* represent the internal abdominal rings through which the round ligaments pass.

stretch the bladder taut and smooth in every direction. The fascia and mucous membrane along the longitudinal line of the vaginal incision are now trimmed off sufficiently to make them fit snugly the base of the bladder, and they are then to be stitched together with interrupted sutures of chromicized gut. The dressing consists of a light packing of gauze in the vagina. In cases in which lacerations of the cervix and perineum complicate the cystocele, these injuries should be repaired at the same sitting. If displacement of the uterus also exists, this may be relieved by shortening the round ligaments through the anterior vaginal incision previous to stitching up the bladder.

IV. Diseases of the Vulva.—The vulva, the pudenda, or the external genitals of the female, comprise all the structures immediately external to the hymen and surrounding the entrance to the vagina. Anatomically these parts are very distinct. Posterior to the hymen are the fossa navicularis, the posterior commissure or fourchette, and the perineum. Anteriorly are the urethral orifice, the vestibule, the clitoris, and the mons veneris, and at the sides the labia minora (sometimes called the nymphæ because they preside over the water brooks), and the labia majora. It is important to recognize the position of certain ducts opening in the mucous membrane of these parts. The most important of these are: the Bartholinian ducts, which supply an exit for the secretions of the glands of the same name, and whose orifices lie at either side of the hymen and exterior to it; and the mucous crypts known as Skene's glands, which may be found inside the meatus urinarius. These ducts, as well as the meatus, are the frequent foci of inflammation in the mucous membrane of the vulva. The hymen marks the boundary between the external and internal organs of generation, and may be classified as belonging either to the vulva or to the vagina. When intact, or in its caruncular form after rupture, it participates in all inflammatory processes of the vagina or vulva.

The function of the vulva is to close the entrance to the vagina and to protect it against the entrance of air, dust, and bacteria. This is accomplished not only by the contact of the labia due to their anatomical position, but by the adhesive secretions which cover their internal surfaces and agglutinate them together. The importance of this function has become clearer during recent years, as we have realized that air and dust are the carriers of bacteria, and that bacteria are the source of inflammation.

The *hygiene of the vulva* is a subject that has been sadly disregarded, and yet is of supreme importance in preserving the health of the genital organs of girls and of women. In the proper observance of the laws of hygiene applicable to these parts lies the prophylaxis of many of the inflammations of the genital tract. Only the commonest attention to cleanliness is necessary to prevent the accumulation of secretions in the creases and folds of the pudenda, and yet it is a very common experience in examining women, even of the better class, and those who would be insulted if they were told that they were not cleanly, to find accumulations of smegma, in the sulci between the labia minora and majora and about the clitoris, discolored with dirt and of most unpleasant odor. Muco-purulent discharges also frequently escape between the labia and smear their external surfaces. Such secretions afford a lodging-place for the clouds of dust that roll up from the street under the women's skirts, and become culture media for all sorts of micro-organisms, which travel from these foci along the genital tract to the vagina, cervix uteri, fundus, and Fallopian tubes. The proximity of the anus is another source of bacterial infection, and therefore in women especially it demands hygienic care. These parts certainly demand as frequent bathing as the face, and should be thoroughly cleansed with soap and water at least once every day. Open drawers, so commonly worn by women, expose these parts to contact of street dust. They should never be worn The tight drawers afford the only efficient protection against street dust and sudden changes of temperature, in both old and young. Women should also be taught to change the napkin frequently during the monthly molimen, whether it becomes saturated or not. Menstrual discharges take on fermentation very promptly, and when kept for several hours in contact with the heated parts about the vulva, they not only make the individual offensive, but become active sources of infection to the genital tract. If the menstrual flux is free or excessive, the necessity for frequent changes of napkin can be obviated by taking a tepid aseptic vaginal douche for cleansing purposes once or twice each day. By having the temperature of the fluid used in the douche at 110°–115° F., the amount of the flow can be materially lessened or entirely interrupted. When the douche is used simply for cleansing purposes, the temperature of the water should not be above 100° F.

Through tradition as well as in accordance with the Hebrew law it has long been accepted as axiomatic that a woman should not bathe during the monthly molimen. A moment's reflection should satisfy any reasonable person that such teaching is unwise. If there is ever a time in a woman's life when she needs a tub bath it is during the days of menstruation. During this period not only are the glands of the genital tract stimulated to an unwonted degree, but the cutaneous glands of the groins and axillæ, and indeed of the entire surface of the body, take on unusual activity. These sudoriferous and sebaceous excretions, if not removed by the daily bath, undergo fermentative changes, become rancid and foul-smelling, rendering many an otherwise attractive creature anything but an agreeable companion. Women are aware of this, and, to overcome it and make their presence less offensive, they saturate their handkerchiefs and clothing with perfumery of all kinds. In the mean time the pores of the skin become occluded with accumulations of excretions, the glands cease to do their physiological work, and the woman suffers from headache and indigestion.

Malformation of the Vulva.—The key to all malformations is usually to be found in the embryology of the affected part. The malformation is the result either of a lack of development, an excessive development, or a misdirected development. In the vulva the first and simplest form, although not the most common, is illustrated by what is known as the infantile vulva, *i.e.*, the character of the vulva during infancy persists into adult life. The labia majora are less developed than the other parts, the vulvar cleft being more exposed to view. The mons veneris is lacking in prominence, and there is absence of hair. The persistence of this form of the vulva is usually indicative of imperfect development of the internal generative organs as well. The type of excessive development is seen in cases of double vulva. Three such cases have been observed and recorded. In these there were two vulvæ situated side by side in the interfemoral space. The type is exhibited in what is known as pseudohermaphroditism, in which there is such an excess of development of some parts and lack of development of others, or such a confusion of development of the apparent organs of both sexes that it becomes difficult to decide to which sex the individual belongs. Such cases are rare, and are interesting as curiosities or freaks of nature rather than as cases for medical or surgical treatment.

A condition of practical importance is that of *vulvar atresia*. This is produced by more or less permanent adhesions between the labia of opposite sides, thus apparently obliterating the vulvar cleft. There is usually a small opening anteriorly, through which the urine finds exit with greater or less difficulty, but the menstrual discharge is frequently retained in these cases. But even if the discharge be not retained, trouble is apt to arise when attempts at sexual intercourse are made. The labial adhesions may give way under this pressure, or it may be necessary to dissect them apart. Sometimes the labia may be torn apart, but if this occurs in the nuptial bed serious hemorrhage may result. Adhesions may not be confined simply to the labia; they may also involve the clitoris and the prepuce, or adhesions between these parts may exist independently. This condition is analogous anatomically to the adherent prepuce in the male,

and may be attended with similar nervous symptoms, even persisting to adult life. The treatment consists in freeing the tissues from these adhesions. This may be accomplished in some cases by simple manipulation with the fingers. In other cases, however, the adhesions have become so thoroughly organized as to require careful dissection under general anæsthesia.

Vulvo-vaginal Anus.—This malformation, known under various names as anus vulvalis, vulvar anus, atresia ani vaginalis, or atresia ani vestibularis, is the result of arrested development at the cloacal stage. There is no anal opening in the normal position, the contents of the rectum finding exit through an opening near the site of the hymen, either external or internal to it. There may be two openings near to each other, or one may be at the normal site of the anus and the other at the hymen. In some of these cases the patient may have satisfactory control of the movements of the bowels. Under such circumstances the discovery of the condition may be entirely accidental, and no surgical interference is required. But when fæcal incontinence exists, operative measures become necessary. The effort of the surgeon should be to make an artificial anus at the normal seat of that orifice. Control may be secured by splitting the fibres of the levator ani muscle and dragging the rectum through to secure sphincteric control, or the rectum may be twisted upon itself 180° for the purpose of securing a valve-like action, or both devices may be employed. To relieve this condition effectually requires all the ingenuity of the most experienced plastic surgeon. Some authorities advise delaying all interference till the age of puberty. But there are many reasons for the opinion that the earlier the abnormality is relieved the better. In the young and formative years nature will do more toward developing sphincteric control than in later years. Moreover, by early repair the child will be saved years of discomfort and embarrassment that would necessarily retard its mental, moral, and physical development.

Analogous to the condition just described are the malformations known as *hypospadias* and *epispadias*. In the former the posterior wall of the urethra is lacking, and in the latter the anterior wall. Epispadias may be accompanied by extroversion of the bladder or by extension of the sinus to the clitoris, dividing it into two parts. The one symptom of these conditions is incontinence of urine. Control may be secured by plastic operations, and in cases in which sufficient length of urethra can be secured for the purpose, the urethra may be dissected out and twisted on its longitudinal axis one-fourth or one-half the circumference of a circle and stitched in that position.

Injuries of the Vulva.—These may be due to external violence, to coitus, or to parturition, and are serious on account of the profuse hemorrhage that is apt to attend them. The patient may fall astride a stepladder or the back of a chair, or as a child she may fall on a picket fence, or in sliding down an incline may transfix these parts on any pointed object. There is on record the case of a child who, on sliding down from a haymow, came astride the sharp stake of a hayrack. The stake entered at the vulva, passed up through the abdomen, and made its exit below the ninth rib of the left side, entirely transfixing the body. It is noteworthy that the child recovered and lived for three years, dying finally of scarlet fever.

Bicyclists may be thrown from their saddles upon the frames or handle-bars of their wheels and receive serious injuries of the vulva. Coitus rarely produces injuries except in cases of rape in children and women of advanced years. In such cases damage is done to the hymen, the fourchette, and the posterior wall of the vagina. In parturition the vulva may suffer from contusions or lacerations by the head of the child or from the unskilful use of the forceps. In cases of external violence and in puerperal cases it is well to remember that there may be deep hemorrhage into the connective tissue, resulting in hæmatocele. The tumor thus formed may be small and inconspicuous, or it may assume large proportions, dissecting into the connective tissue of the pudenda, and even spreading up into the abdominal wall. The tension upon the external tissue may be so great as to cause rupture of the walls of the tumor and allow the clots to escape. If an artery is involved in the injury, the condition may be converted into one of actual hemorrhage. In a small hæmatocele the clot under gentle pressure usually becomes absorbed, but in cases of severe contusion or of excessive hemorrhage gangrene may supervene. The symptoms of pudendal hæmatoma or hæmatocele are rapid swelling of the labia and pain. Discoloration of the skin follows, the color changing from red to blue and green, and, as absorption progresses, to bronze. The tumor at first is tense, but gradually it becomes boggy and soft. If the hemorrhage is copious, there may be symptoms of shock. The treatment consists in stopping the hemorrhage, if still in its active stage, by applications of ice, or by pressure effected by means of pads and bandages. If this is not effectual and the tumor continues to develop rapidly, it may be necessary to cut down upon the bleeding vessels and secure them by ligature. If in due time absorption does not set in, and the tumor shows signs of breaking down and suppurating, with more or less elevation of temperature, the tumor must be treated as an abscess, *i.e.*, by free incision and drainage.

Vulvitis.—If we accept the modern scientific dictum that all inflammation is the manifestation, or the result, of an invasion by micro-organisms, inflammations of the vulva may be classified according to the genus of the infecting organism. But, as all the infecting germs have not yet been discovered, and as the part played by each organism in a mixed infection has not been positively determined, the clinical picture, the signs, and symptoms must still be depended upon in many instances as a reliable guide to diagnosis and treatment. Irritating discharges from the vagina, which spring from gonorrhœal or from septic inflammation of the vagina or the uterus or from cancerous ulceration of the cervix, may cause inflammation of the vulva. The infection may come from without or from the morbid germs carried in the discharges. In such cases applications of silver nitrate in solution (1 in 20), should be made to the external parts after they have been thoroughly cleansed, and then some protecting ointment, as oxide of zinc, should be applied. At the same time vigorous treatment must be directed to the cause of the disease.

Aphthæ or thrush of the vulva is an infection similar to that which invades infants' and children's mouths. It is apt to attack nursing women. The infecting agent is the vegetative organism oïdium albicans. The disease is characterized by a white exudate elevated on an inflammatory base. It occurs in discrete patches. The treatment consists in bathing the parts thoroughly with a solution of bichloride of mercury (1 in 2,000),—the procedure to be repeated daily.

Chancre and chancroïd of the vulva have the same significance and characteristics as the same lesions in other parts, and the treatment is the same.

Diphtheria of the vulva is found almost exclusively in puerperal women, although it may attack children. It is usually ushered in by a severe chill, followed by a sharp rise of temperature to 104° or 105° F., and a rapid and feeble pulse. Inspection reveals the presence of the yellowish-gray membrane containing the Klebs-Loeffler bacillus. Thorough antiseptic washes should be employed and prompt constitutional treatment instituted. Full doses of antitoxin hypodermatically are the sheet anchor.

Erysipelas of the vulva is due to the invasion of the streptococcus erysipelatis, and is recognized as a desperate condition. It may follow operations upon the external genitals, may appear without warning as a complication of diabetes mellitus, especially in aged women, or may be the first stage in the march of invasion of a puerperal sepsis. In the last instance the serious symptoms manifest themselves in the uterus and adjoining structures. The rich supply of lymph spaces and channels in and about the pudendal structures afford a good field for the spread of this particular infection, and the

treatment should be prompt and vigorous, both sustaining and local. Iron internally and lead and opium wash externally still hold as the specifics. The bowels should be kept freely open with salines.

Skin Diseases of the Vulva.—Skin diseases have been treated very fully in the articles devoted to them, but there are certain localized conditions of the skin of the external genitals which come more directly under the care of the gynecologist, and which may therefore properly be considered here. Among these may be mentioned such common affections as intertrigo, erythema, and eczema, all of which are largely the result of filth. Thorough and persistent attention to cleanliness, and, in aggravated cases, the employment of soothing lotions or dusting powders, constitute all the treatment that is called for.

Folliculitis is a pustular eruption due to the invasion of the hair follicles by the staphylococcus pyogenes albus, aureus, or citreus. The entire skin surface of the vulva may be completely covered with conical-shaped pustules, each having a hair springing from its summit. The disease is apt to occur in anæmic, debilitated women, but is due directly to lack of cleanliness. Sometimes the skin is red and inflamed, and burning and itching may be present. In other cases there will be no unusual sensation whatsoever, the pustules being discovered by accident, as it were, after they have invaded a large area of tissue. Constitutionally the treatment should be sustaining, and locally the application of strong antiseptics is indicated. Moist dressings of bichloride of mercury, 1 in 2,000, or carbolized or sulphurated ointments, may be applied to the affected skin, for the purpose of promptly destroying the infecting agent. Epilation is usually unnecessary.

Herpes genitalis has already been discussed in sufficient detail in a previous volume (Vol. IV., page 685).

The parasitic affections of the vulva, *i.e.*, the common ones, are eczema marginatum, or ringworm, and the irritation caused by the pediculus pubis. The former appears in reddish, moist, pigmented areas, of circular or curved form, and with raised borders. Over the surface of these areas are scattered small vesicles or pustules with yellowish crusts. These may be confined to the labia or they may spread back to the anus or forward over the mons veneris and abdomen, and out on to the thighs. The sovereign remedy is sulphur, either in the form of sulphurous acid on compresses, or as one of the sulphur ointments. The pediculus or louse that infests the hairy parts of the pubes is a crab-like insect, and can be found holding fast to a hair, and inserting its proboscis into the sebaceous follicle, from which it derives its sustenance. It produces an intense itching. When the presence of the parasite, however, is once discovered, relief is promptly secured by one or two applications of mercurial ointment (blue ointment), which destroys both the insect and the nits.

Pruritus Vulvæ.—Many affections of the vulva are attended with the most intense burning and itching. In neurotic patients it becomes absolutely intolerable, and in some instances causes loss of sleep, physical exhaustion, and nervous depression leading to melancholia and other forms of insanity. The distress may be aggravated by the effort to procure relief by scratching or rubbing the parts. In this way sexual excitement and orgasm are produced and a habit of masturbation is established.

Pruritus is only a symptom, but like dysmenorrhœa it is so common and persistent, and withal so obscure in its etiology, that it demands a special chapter for itself in all gynecologic treatises, even the most recent and scientific. It will be treated here under the following headings: Puerperal pruritus, diabetic pruritus, parasitic pruritus, and neurotic pruritus—also termed kraurosis vulvæ.

Puerperal Pruritus.—Pruritus is not an unusual accompaniment of pregnancy, and may arise at any time during the period of gestation. At this time the secretions from the glands about the vulva and vagina are markedly increased, and, unless the patient is scrupulously clean, they are apt to become culture media for irritating microorganisms.

In this variety of pruritus, as in all cases of this affection, the parts should be carefully inspected to exclude parasites, the urine should be examined to exclude or confirm the presence of diabetes mellitus, and the amount of the local secretions should be determined.

If parasites or diabetes be present, the appropriate treatment should be applied; otherwise hygienic measures should be prescribed, including sitz-baths and vaginal douches of bichloride of mercury or carbolic-acid solutions. Local applications of black wash (oxide of mercury), carbolic-acid solution (1 in 40), or Unguentum zinci oxidi are also efficient.

Pruritus is one of the early symptoms of diabetes mellitus, and in all cases of itching and burning of the vulva the urine should be examined for the presence of sugar. The exhibition of appropriate treatment for this disease will permanently relieve the local symptoms. Local applications, similar to those recommended above, may be necessary for immediate relief.

The two parasites that most commonly infest these regions are the pediculus pubis and the trichophyton tonsurans or ringworm. The former seeks its habitat among the hairs of the pubes, gaining its sustenance from the sebaceous glands about the hair follicles. It hangs with its head seemingly buried in the skin, and is difficult to remove. This insect is commonly known as the crab louse. It deposits its eggs or nits on the hair shafts. Two or three applications of Unguentum hydrargyri (blue ointment) will destroy both the insect and the nits. Kerosene oil also acts efficiently.

Kraurosis vulvæ is characterized by a withered, parchment-like appearance of the surfaces of the labia majora and the external surfaces of the nymphæ. It may also extend to the mons veneris and the tissues about the clitoris. The folds are gradually obliterated, and there is a general contraction of the introitus vaginæ. Intercourse is extremely painful, and an intolerable burning and itching persist during the early stages. These latter symptoms may become intermittent as the disease progresses. In the early stages there may be thickened, hypertrophied areas of skin which are sensitive to the touch; they are interspersed throughout the areas of sclerosed atrophic tissue. Gradually the whole surface becomes atrophic and takes on the parchment-like appearance. The disease, which comes late in life, usually after the menopause, is a progressive one, and is relieved only by the removal, by dissection, of all the vulva. It is not necessary to postpone the operation until the disease has become self-limited. The amount of tissue removed is of no great importance except that it should include all that may possibly be invaded. The operation consists in making an incision, at the junction of the skin and mucous membrane, from the clitoris around the entire circumference of the introitus. A second incision, concentric with the first, is made through the skin around the entire vulva at the outer margin of the invaded tissue. The tissue included between these two incisions is next dissected out. The edges are then coaptated by interrupted sutures of chromicized catgut or silkworm gut. Bleeding parts may be secured by ligature, but the general oozing is controlled by the sutures. In cases in which the disease invades the mons it is necessary to include the clitoris in the exsected tissue. A strong ligature of catgut, transfixing the clitoris at its base, will control hemorrhage from the vessels of that organ. In applying the stitches the parts should be adjusted, as the necessities of the case require, to give nice apposition.

Hypertrophy of the Vulva.—Hypertrophy of the clitoris is not uncommon. It may be congenital or acquired. It usually accompanies those malformations which go to make the pseudohermaphrodite. Fehling has reported the case of a girl, twenty-one years of age, with a clitoris five inches long, an inch and one-half thick, terminating in a glans one inch long. Hypertrophy of the labia minora, especially elongation, is not infrequently met in gynecologic practice. Certain pathologic processes may

produce this; it may also be congenital or it may be the result of manipulation. As is well known, the Hottentot apron is simply the enormously elongated nymphæ produced by manipulation practised upon the female children from infancy. Elephantiasis vulvæ is a pale or grayish-white tumor arising from any or all of the pudendal structures. It may attain a large size, reaching to the knee. It is composed of fibrous and subcutaneous connective tissue and enlarged and numerous lymph vessels. The surface may be smooth or warty, and when the lymphatic tissue predominates the tumor may present the appearance of a bunch of grapes. Various venereal affections may accompany this condition. The treatment is surgical and consists of radical removal of all the hypertrophied tissue.

Condylomata, or venereal warts of the vulva, present the appearance of warty growths springing from the mucous membrane or from the skin of the vulva. They are auto-inoculable, and may spread on to the mons and down over the perineum and anus, and even on to the thighs. They may be due to simple filth infection of the papillæ of the skin or they may spring from the inflammatory base of a gonorrhœic or syphilitic infection. In rare instances these excrescences become confluent and form large cauliflower-like masses resembling carcinoma. The clinical symptoms and the microscopic examination will give a well-marked differential diagnosis. The treatment consists in their removal either by caustics, by the galvano- or thermo-cautery, or by the scissors. They are apt to bleed profusely when curetted or cut away, and it becomes necessary to touch the base with caustics, with perchloride of iron, or with a strong solution of salicylic acid (ʒ i. ad ℥ i.). In some instances it may be necessary to put in catgut sutures to control the hemorrhage.

There are tumors of the vulva which cannot properly be classified as neoplasms, but which nevertheless demand attention here for the purpose of presenting the factors involved in a differential diagnosis. These are intestinal hernia, omental hernia, hernia of the ovary, and cyst of the vulvo-vaginal gland. Intestinal (inguinal) hernia may appear suddenly during a supreme effort at lifting, or as a result of a sudden and unexpected strain, or it may come on gradually. It is usually pyriform with the larger base below, and on percussion it gives the tympanitic note. It may or may not be reducible. Hernia of the omentum gives the same clinical features with the exception of the tympanitic note. Hernia of the ovary is apt to be congenital, but not always. The tumor is small, sensitive, generally irreducible, and it increases in size and becomes painful at the menstrual period. Ovarian hernia occurs also in women whose abdominal walls have been relaxed by frequent and repeated gestation. In these cases the Fallopian tube may be present with the ovary, a coil of intestines and the omentum. The presence of the ovary is manifested by the characteristic dull, sickening pain, aggravated at menstruation to a degree of acute suffering, and by nausea and exquisite tenderness on pressure. In these latter cases the hernia may be reducible, but in congenital cases the ovary is usually fixed.

The treatment of ovarian hernia is surgical, but in all instances, in which this is possible, the ovary should be returned to the pelvic cavity and the hernial opening permanently closed. In exceptional instances, however, extirpation of the ovary is the only resource available, but this must not be undertaken without a recognition of the possibility that it may be the only ovary that the patient possesses, and that the operation is not by any means devoid of risk.

Cyst of the vulvo-vaginal gland is an affection of so great frequency and importance as to demand a separate and independent article (see article on *Bartholin's Gland*, Vol. I., p. 734).

Varicose tumors of the vulva occur frequently during pregnancy. In some cases they cause great pain; in others they burst and occasion serious hemorrhage. Gentle massage and pressure are sometimes efficient in emptying the veins, but the condition may become so extreme, even during pregnancy, as to demand operative procedure. A ligature *en masse* or a mattress ligature may be applied, and the tumor cut away; or the skin may be incised at the base and a catgut ligature applied, after which the skin may be sutured over the stump. Complete asepsis must be observed.

Cancer of the Vulva.—Primary malignant disease of the vulva is comparatively rare. Histologically, it may be epithelioma or sarcoma. Topographically, it may originate in the clitoris, the peri-urethral tissue, the labia, or the perineum. It occurs late in life, with the greatest frequency between forty and sixty years of age. The neoplasms are characterized by a rapid and extensive new formation of tissue and a tendency to early ulceration. The lymph glands, especially those in the inguinal region, are usually involved. The secretion consists of a serous or bloody fluid with a fetid odor. When the peri-urethral tissue is involved the urethra, by vaginal touch, is felt as a round, hard cylinder. The tendency of the disease is to spread internally, the vagina, the rectum, and the bladder being successively involved. The earliest symptom may be a pruritus, but, as the disease advances, the pain becomes increasingly severe. The progress of the disease, if it has not already advanced too far, may be arrested by complete extirpation either with the thermo-cautery or with the knife and scissors. The *x*-ray gives promise of a permanent cure in many of these cases. In those in which ablation is not practicable or the *x*-ray fails to cure, palliative measures consist in thorough and frequent cleansing by douches and antiseptic washes and in the employment of iodoform gauze dressing. The best deodorizers and disinfectants are bichloride solutions, ichthyol, carbolic acid, and formaldehyde. Anodynes are required, both locally and hypodermically, and as frequently and in as full doses as may be necessary to relieve the suffering.

V. Vaginitis.—*Definition.*—Vaginitis is an inflammation of the mucous membrane which lines the vaginal canal. It appears in all grades of severity, from a simple blush of color, with slight heat and dryness, to the most virulent inflammatory action with its attendant constitutional symptoms.

No period of life is exempt from it. It is met with in young girls, in women during the child-bearing period, and in women who have passed the climacteric.

It is most important to distinguish the two varieties—simple or non-specific, and specific or gonorrhœal. They differ primarily in their cause or etiology, and in their remote effects; the one when uncomplicated being attended with only a certain amount of personal discomfort and a limited impairment of general health, while the other may involve, in its later manifestations, serious inflammatory action within the peritoneal cavity—an inflammation which may result in chronic invalidism or even in death.

For convenience of description the subject will be considered under two heads: Simple or non-specific, and specific or gonorrhœal. Simple vaginitis demands consideration under three heads, as it appears: I. In girls prior to puberty; II. In unmarried women; III. In married women.

Vaginitis in Children.—Vaginitis in young girls between the ages of three and seven, and even later, is a very common affection. It usually shows itself in the form of a chronic catarrh. But it may vary in severity from this mild subacute inflammation to one attended with copious discharge and pain, with swelling and excoriation of the labia. The vulva and vagina, as far as can be seen, are sensitive and red, and even the buttocks and inner surface of the thighs may be inflamed and irritated. As a complication in children, it must not be forgotten that gonorrhœal peritonitis is not uncommon, the infection reaching the abdominal cavity through the Fallopian tubes. Forty cases of this character have been collected from the literature. A mistaken diagnosis is apt to be made, owing to the fact that the appendix is naturally involved in the general inflammation. The