
Chapter 3

DISEASES OF THE EXTERNAL GENITALS AND VAGINA

For clinical consideration it is convenient to discuss the diseases of the external genitals and vagina in the following order:

Classification

Gonorrhoea.

Diseases of the Vulva.

Pruritus Vulvae.

Vulvitis—Intertrigo, Eczema, Herpes, Bacterial Infections, Parasitic Infections, Leukoplakic Vulvitis.

Ulcerative Diseases of the Vulva and Vagina—Simple Ulcers, Chancroid, Syphilis, Tuberculosis, Granuloma Inguinale, Lymphogranuloma Inguinale, Rarer Ulcerations.

Nonmalignant Growths and Swellings—Condylomas, Stasis Hypertrophy, Pudendal Hernia, Pudendal Hydrocele, Varicose Veins, Tumors, Injuries, Hematomas.

Malignant Diseases—Carcinoma, Sarcoma, Metastases.

Vulvovaginal Gland Diseases—Inflammation, Abscess, Sinus, Cyst.

Diseases of the Vagina.

Injuries.

Vaginitis—Simple Vaginitis, Trichomonas Vaginitis, Monilia Vaginitis, Atrophic Vaginitis, Diphtheritic Vaginitis, Emphysematous Vaginitis.

Nonmalignant Growths or Swellings—Endometriosis, Solid Tumors, Cysts.

Malignant Diseases—Carcinoma, Chorionepithelioma, Sarcoma.

Urethral Conditions—Eversion of mucosa, prolapse of mucosa, urethral caruncle, skenitis, suburethral abscess, urethral diverticulum, ureterocele, female prostate, cancer of urethra.

Miscellaneous Disturbances—Skin Diseases, Adhesions of Prepuce or Labia, Hyperesthesia of Vaginal Entrance.

GONORRHEA

Gonorrhoea is inflammation of the genital organs produced by the gonococcus. The term, when not qualified, is understood to mean gonorrhoeal inflammation of the vulva, vagina, and urethra, i.e., gonorrhoeal vulvitis, vaginitis and urethritis. If the process extends into the uterus or fallopian tubes or bladder, it causes complications known, respectively, as gonorrhoeal endometritis, gonorrhoeal salpingitis, and gonorrhoeal cystitis. Gonorrhoea is sometimes referred to as "specific" vaginitis or vulvitis or urethritis.

Etiology

Gonorrhoea is caused by contact of the affected organs with a gonorrhoeal discharge, usually in sexual intercourse. The infecting germ (the gonococcus) is a diplococcus, easily stained, and is found in large numbers in the pus cells of all acute gonorrhoeal discharges. In chronic gonorrhoeal discharges it is not

found so abundantly—in fact, in some cases, it is so scarce as to be very hard to find and may even disappear entirely for a time.

Though the usual cause of gonorrhoea is sexual contact with an infected person, it may exceptionally be caused by other means, as by contact with an infected towel, douche nozzle, chamber utensil, or closet seat.

All discharges containing the gonococcus are capable of causing gonorrhoea. The slight urethral discharge from a chronic deep urethritis or from a stricture, persisting months or years after an attack of gonorrhoea in the male, is very liable to cause gonorrhoea when brought in contact with virgin soil.

A sad exemplification of this fact is seen in the many instances in which a bride is infected by her husband, who had gonorrhoea years before but supposed himself well. The consequence of such infection is that, instead of a healthy, happy woman with sons and daughters, the wife becomes a confirmed invalid in a childless home. This danger is not sufficiently appreciated by men generally—in fact, the man usually does not know the danger until too late. The responsibility of physicians in this matter is great, for the physician must decide when a man who has had gonorrhoea may safely marry. The *Criteria of Cure* are given after *Treatment*.

Pathology

In the adult the thick squamous epithelial lining of the vestibule and vagina is resistant to the gonococcus, somewhat like the external skin surface though to a less degree, but the gonococcus flourishes on the mucous membrane of the urethra, vulvovaginal glands, and cervix uteri. The discharge from these foci irritates the vaginal and vulvar surfaces, causing considerable vaginitis and vulvitis, which, however, may subside within a short time. Usually only the meatus or lower third of the urethra is involved, hence the urinary symptoms in women are usually mild and of short duration, unless carried higher by too active treatment or by catheterization. Skene's glands, or ducts, in the urethra are likely to be penetrated, and there the process may remain indefinitely.

In the cervix, upward extension is often limited for a long time by the internal os. During or following menstruation is the usual time for extension upward, causing acute endometritis and perhaps later acute salpingitis.

Though extension superficially along the mucosa is a striking characteristic of the gonococcus, it does penetrate deeply at times and may be carried to distant parts. The occurrence of gonorrhoeal joint troubles and gonorrhoeal endocarditis shows the penetrating power of the germ and indicates the serious complications that may come from the infection. In addition, it opens the way for invasion by other bacteria and, all in all, is a common cause of distant "focal" infections.

In reinfection in adults the process is comparatively mild and is usually limited to certain areas, for example, the urethra or the cervix.

Symptoms

Within a few days after suspicious coitus the patient complains of slight irritation about the genitals. The parts feel dry and uncomfortable, and there

may be a slight burning sensation. The feeling of discomfort increases and a discharge appears. About the same time or a little later, there is noticed a smarting or burning on urination and increased frequency of urination. Within two or three days of the beginning of the trouble the discharge is profuse and the signs of irritation (burning and itching and frequent painful urination) are marked.

On inspection, the structures immediately surrounding the vaginal orifice are found reddened and painful on pressure. There is a yellow discharge from the vagina and frequently some discharge from the urethra.

On digital examination, the vaginal walls are found rough and hot and tender. Pressure on the anterior vaginal wall, directed from the upper end of the urethra to the meatus, may bring to view one or more drops of urethral pus. If the case has passed beyond the acute stage, the pain and discomfort are not so marked, but the discharge, more or less profuse, is still present.

Diagnosis

Gonorrhoea must be distinguished from vulvitis and vaginitis due to various other causes. When a patient comes with a rather severe vaginitis, there are four types in particular to be considered, namely, trichomonas, gonococcal, monilia, and atrophic. The special features of each are shown in Figs. 254 to 257. *Trichomonas vaginitis* is the type present in a large proportion of the cases of persistent or recurrent vaginal inflammation of considerable severity. If examination be made after omission of douche for a few days, one may usually observe the characteristic appearance shown in Fig. 254. Covering the tip of the speculum is a pool of thin yellow pus. In addition to the general redness of the vaginal wall, punctate hemorrhagic spots may be seen. These are likely to be grouped; the grouping perhaps representing the activity of one organism or of two or more working close together. The wall presents also streaks of the yellow pus but no patches of membrane and usually no yellow roll of cervical pus.

In *gonorrhoeal vaginitis* there is generally a thick and tenacious yellow roll of pus coming out of the cervical canal, as shown in Fig. 255. This jelly-like yellow roll is stringy and difficult to clear out of the cervix. The discharge in the vagina is somewhat similar though there is admixture of thinner discharge from the vaginal wall. *Mycotic vaginitis* (usually monilia) is less frequent and the patches of membrane as shown in Fig. 256 are characteristic. Brushing off a patch of membrane reveals the red inflamed surface beneath it. *Atrophic vaginitis* may be quite severe, with distressing burning and itching, with very little discharge. The scarcity of discharge with the annoying symptoms is one of its features. In addition, there is the general redness of the vaginal wall due to the atrophic (senile) thinning of the lining epithelium. Also, wherever the wall is brushed with some pressure, there appear fine bleeding points, as shown in Fig. 257. The slight trickle of blood from the points may join and form a drop, rolling down on the speculum. In addition to the above-mentioned special appearances, there are often associated conditions which assist in differentiation. In gonorrhoeal inflammation, there is a tendency to involve the urethra and the vulvovaginal glands as well as the cervical

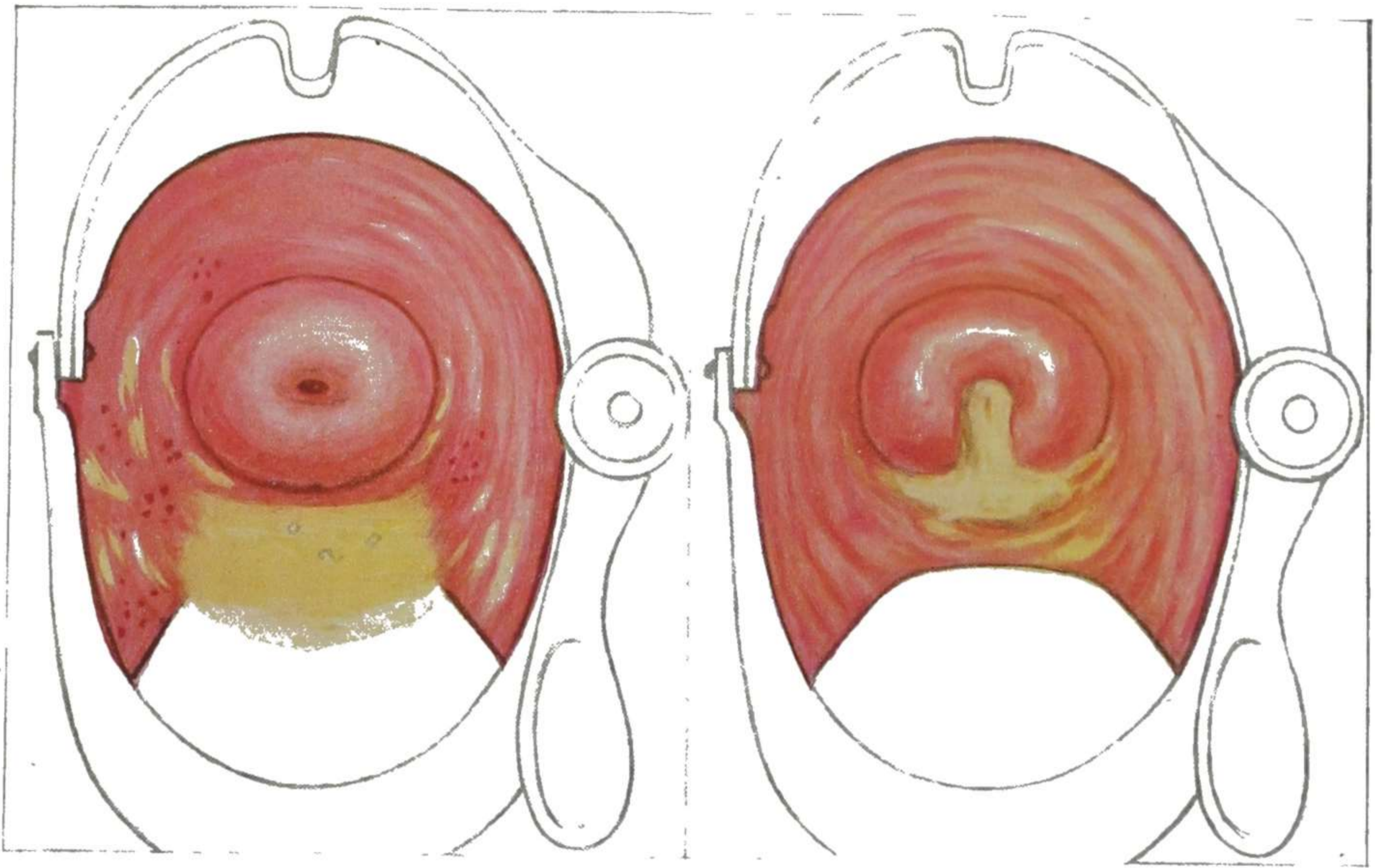


Fig. 254.

Fig. 255.

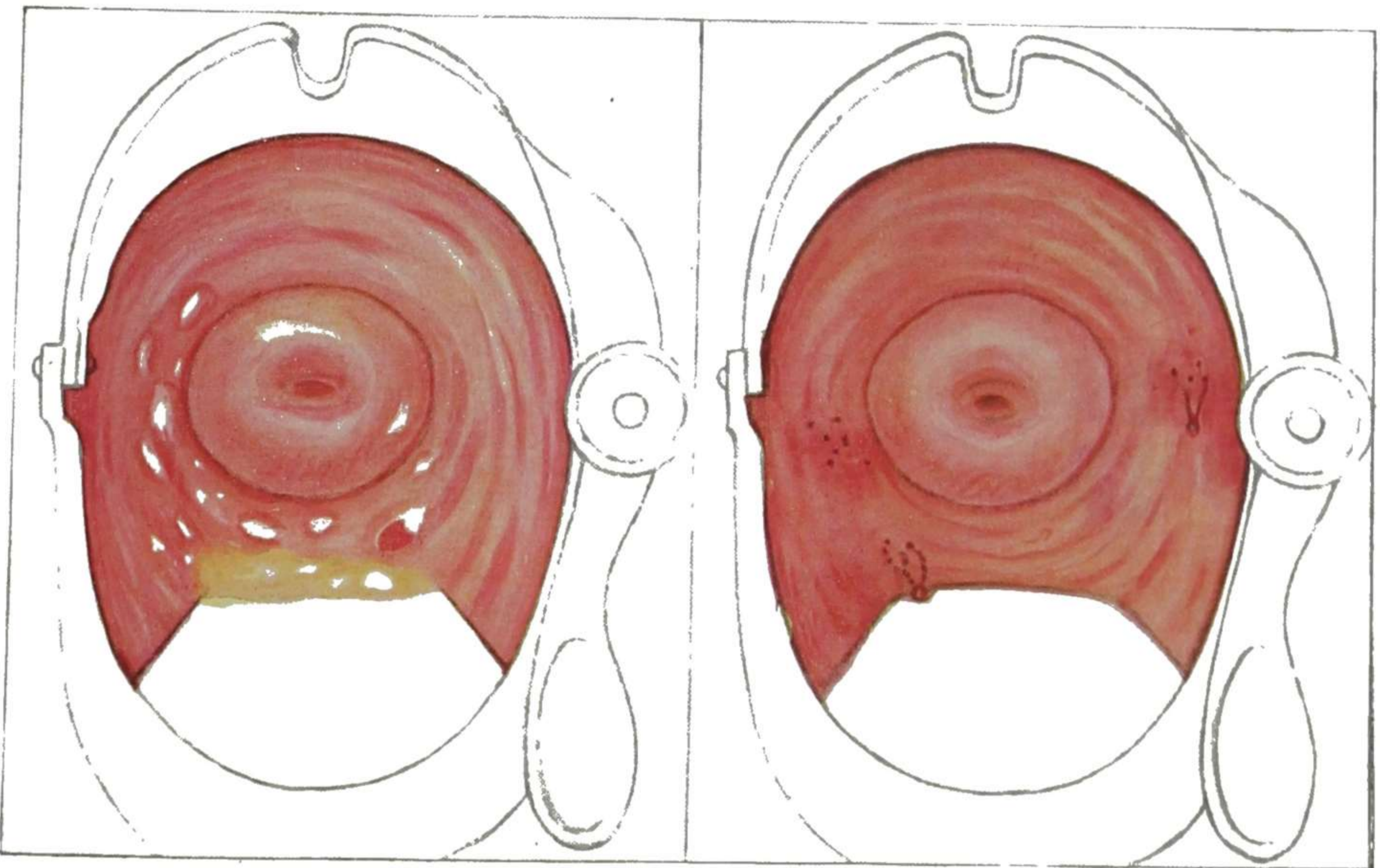


Fig. 256.

Fig. 257.

Fig. 254.—*Trichomonas* vaginitis, showing the thin yellow discharge with general redness of the vaginal wall and hemorrhagic spots (minute ulcers). In some cases there are gas bubbles in the discharge. The cervical canal is clear—no yellow plug as in gonorrhea.

Fig. 255.—Gonorrheal vaginitis. The inflammation is principally in the cervical canal, which is filled with a yellow plug of tenacious mucus. This tenacious yellow discharge extends out into the vagina, causing some vaginitis. But there is no severe vaginal inflammation with hemorrhagic spots as seen in *trichomonas* vaginitis.

Fig. 256.—*Monilia* vaginitis, showing the general redness and the white areas of membrane. When the membrane is scraped off there is likely to be a raw red surface underneath. The discharge is usually small in amount.

Fig. 257.—Atrophic (senile) vaginitis, showing the general redness, due to the atrophic thinning of the epithelial layer of the mucosa and the tendency to punctate bleeding wherever the wall is rubbed. The discharge, if any, is scanty and mostly clear. (Modified from Karnaky's drawings as reproduced by G. D. Searle & Co.)

mucosa. The decisive diagnostic factor is the demonstration of the gonococcus by staining and if necessary by culture.

Staining the Gonococcus.—A specimen for staining is made by smearing a little of the discharge, preferably from the urethra or from a Bartholin gland, on a slide near the end. The corresponding part of another slide is then pressed on the film and the two are drawn apart. This gives two identical specimens, one for the blue staining and one for the gram-negative staining if that should be found necessary. It is advisable to make specimens from the urethra, from a Bartholin gland, and from the cervix if discharge is found in these locations. The slides are allowed to dry and are labeled.

The specimen to be stained blue is fixed to the slide by being passed two or three times through the flame. It is stained by flooding for fifteen seconds with a 1 per cent solution of methylene blue. It is then rinsed with water, the excess of which is removed by gently blotting with filter paper. After the slide is thoroughly dry it is examined with the oil emersion lens. A cover glass is not needed, the immersion oil being dropped directly on the stained specimen.

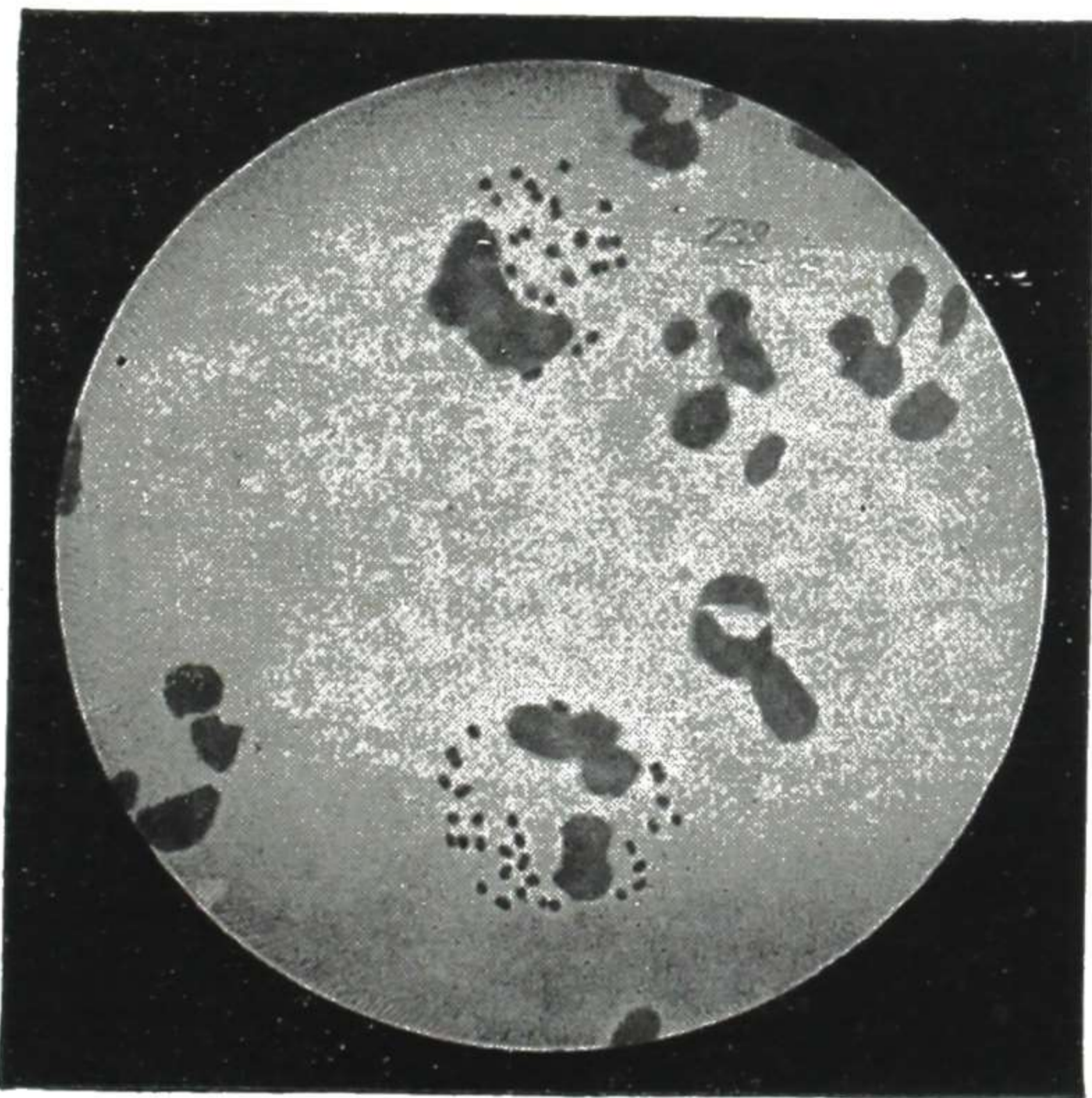


Fig. 258.

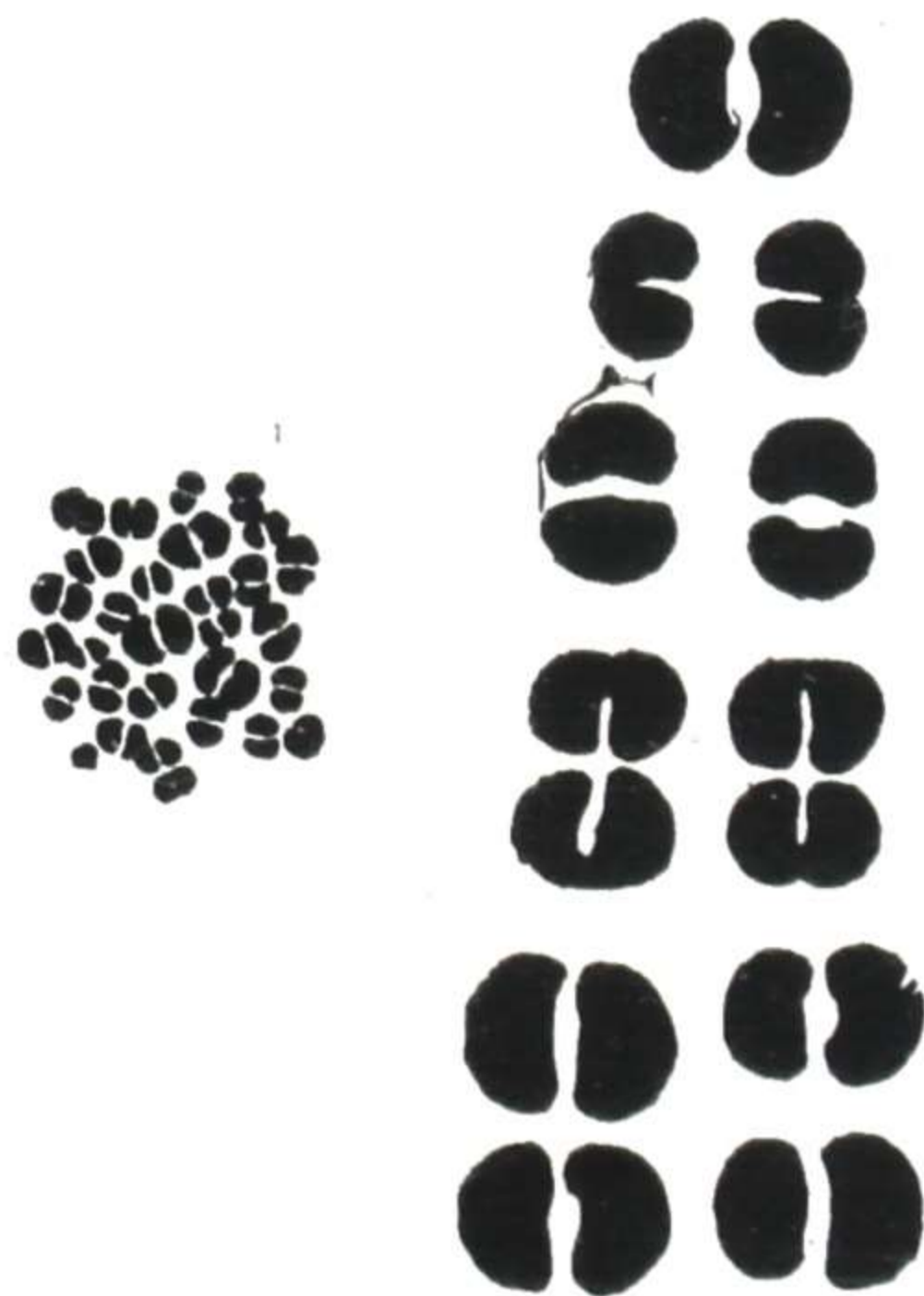


Fig. 259.

Fig. 258.—Specimen of pus from a case of gonorrhoea, stained with methylene blue. This field contains two gonococcus colonies, each within a pus cell. Only the nuclei of the pus cells are seen. The lower colony has the circular outline of the cell containing it. (From Kolle and Wassermann: *Handbuch der Pathogenen Mikroorganismen*.)

Fig. 259.—Indicating the shape of the diplococcus of gonorrhoea (gonococcus). (From Byford: *Manual of Gynecology*.)

The gonococcus and other bacteria stain very dark in comparison with the cell nuclei. The characteristic distribution of the gonococci is well shown in Fig. 258. The roll-shaped diplococci are grouped within the pus cell. This fact is shown by the relation of the group to the stained nuclear parts of the cell and by the rounded outline of the group, the spread of which is limited by the outer cell wall (which does not stain). Cells may disintegrate and release gonococci which are then seen free in the intercellular spaces. A general view of the specimen with the characteristic grouping of intracellular colonies (Fig. 258) is of course best seen with the medium high-power objective, while the individual shape and pairing of the cocci (Fig. 259) are clearer with the oil immersion.

In chronic cases, however, this picture is not usual. There may be only a few organisms and of these only one or several pairs may be found within the cells. In that case, the diagnosis cannot be made positively, since other organisms found in the vagina may give the same picture. Since many, if not most, of these organisms are gram-positive,

staining by Gram's method will help clear the doubt. The diplococcus catarrhalis, however, which is found in the vagina occasionally, cannot be thus distinguished, since it is an intracellular organism and is gram-negative. In doubtful cases it may be necessary to differentiate these organisms by cultural methods.

TIEDEMANN'S MODIFICATION OF GRAM'S STAIN.—A thin smear is dried without heat and flooded with a 2 per cent solution of crystal violet (Hoechst) in methyl (wood) alcohol. The stain is allowed to act for fifteen seconds and is then removed by allowing distilled water to drop slowly from a burette onto the slide for fifteen seconds. It is then washed briskly with distilled water.

The slide is now flooded for fifteen seconds with a solution containing 1 gram of iodine and 2 grams of potassium iodide to 100 c.c. of distilled water. This solution is poured off and the slide flooded with 95 per cent alcohol until no more color is given off. This takes about ten seconds. The slide is then washed with water and dried. It is advisable to counterstain very lightly with a solution of carbolfuchsin diluted with ten times its volume of water. Gram-positive bacteria appear bluish black, while gram-negative bacteria, if counterstained, appear a pale red.

Recently Hucker suggested a modification of this crystal violet stain which shortens the time required to stain the slide; his technique is recommended by The American Public Health Association.

SIGNIFICANCE OF MICROSCOPIC FINDINGS

As already stated, in *acute* or subacute cases there is rarely any difficulty in determining certainly whether the trouble is or is not gonorrhea, the symptoms and bacteriological findings coinciding and settling the matter.

In *chronic* cases, on the other hand, there is often great difficulty. If a few apparent gonococci (shape, groupings, situated in pus cells, decolorized by Gram's method) are found, the diagnosis is not positive, though the strong probability is that the lesion is gonorrheal, if the history and ordinary examination findings point that way. The difficulty is due to the fact that the diplococcus catarrhalis, mentioned above, has the same staining points. Consequently, in cases where the history and clinical findings do not conform to the staining evidence, further differentiation should be made by culture. Though difficult to culture, bacteriologists have developed a satisfactory method by which the gonococcus may be cultured and identified, and in doubtful cases the culture is more reliable than the smear. It is important, as pointed out by Marie Koch, to take the culture during the estrogenic phase of the cycle when the pH of the cervical mucus is around 6.8. In taking the culture no antiseptic solution or lubricating jelly should be used on the speculum as this tends to inhibit the growth of the gonococcus.

In addition to staining, culture, and complement-fixation test in a doubtful chronic case, the following items may give some help: (a) evidence of invasion of Bartholin's glands or of Skene's glands, (b) history of salpingitis, following the vaginal inflammation, (c) sterility, and (d) history of former gonorrhea in the husband.

Treatment

Before stating in detail the methods, it is desirable to make clear the principal purposes of the treatment. They are as follows:

a. **To Prevent Extension Upward** of the disease to the endometrium and fallopian tubes. The extension to the fallopian tubes is a most serious result

of gonorrhoeal infection and may condemn the victims to chronic invalidism or to a serious operation. In either case, there will probably be sterility.

b. **To Relieve the Discomfort** attendant on the inflammation and to prevent contamination of the patient's clothing and surrounding objects with the discharge.

c. **To Eradicate Completely the Infection** from the lower genital tract so that no infective discharge will remain. As long as one spot of gonorrhoeal inflammation remains in the vagina, in the vulvovaginal glands, in the urethra, or in the uterus, the discharge is infective and is a source of danger to the patient and to those around her. At any time, there may be an extension upward to the tubes or there may be infection of the eyes of the patient or of someone else in the household. It is probable that a considerable number of the cases of gonorrhoeal vulvitis in children come from the accidental infection from a contaminated towel or closet seat, in the home or elsewhere.

DETAILS OF TREATMENT

Since the advent of the sulfonamide group of drugs and the antibiotics, the treatment of acute gonorrhoea has been revolutionized. Though the sulfonamides proved to be much more effective than any treatment used up until their discovery, many cases proved to be resistant to this form of chemotherapy because the gonococcus became sulfonamide-fast. The most effective of the antibiotics to date is penicillin. In 97 per cent of the cases the gonococci disappear within three days on the following course of treatment: 300,000 units of procaine penicillin G given intramuscularly daily for three days. Other types of penicillin may be used, but those in oil or wax have the advantage of prolonged action. In patients who show a sensitivity to penicillin, dihydrostreptomycin, 1 gram intramuscularly, is effective in about 90 per cent of the cases; it may be given for several days if necessary. Oral terramycin was used by Beinfield et al. The total dose was 1 gram, divided in two to four doses. Their incidence of cure was 93 per cent. In cases resistant to the antibiotics, sulfadiazine 1 gram four times a day for five days was found to be very effective. In very resistant cases a combination of the chemotherapy and the antibiotics may be necessary, and in addition fever therapy may be used.

In every case the treatment should be given promptly in order to kill off the gonococci in the lower genital tract before they can ascend, which they do usually at the menstrual period.

In explaining to the patient the infectious nature of the trouble and the necessity of avoiding spread to other parts by contact with the discharge, one should be careful not to make statements that may lead to the disruption of an otherwise happy family. By tactful questioning the original source of the infection can usually be determined, and a frank discussion with the responsible partner will usually prevent a recurrence.

Criteria of Cure

In the authoritative symposium on *The Gonococcus and Gonococcal Infection*, published in 1939 by the American Association for the Advancement of

Science, the criteria of cure are considered at length, the following quotations and data applying to the female:

“Adult. In the female the problem of determining the cure is considerably more difficult than in the male. Here the accurate determination of the absence of all clinical evidence of the infection is of the utmost importance, probably more so than the bacteriologic procedures. Such an examination presupposes adequate training in the recognition of the slight evidences of gonococcal infection in women.”

Such a thorough search, besides determining the presence or absence of symptoms such as frequency, dysuria, discharge, and pain, includes careful expression of the urethra and periurethral glands (Skene's glands) for discharge, examination of the Bartholin gland of each side, the cervix uteri, the parametrial tissues, and the tubes and ovaries, and the securing of the following microscopic data.

1. Series of successive smears and cultures from the urethra, cervix, and Bartholin's glands must be negative. The time for taking the specimens should be arranged so as to secure a series before, during, and after menstruation.

2. Provocatives, if used, should be followed by smears and cultures from the above sites.

3. Repetition of above series of examinations five times at monthly intervals is recommended.

“Child. In female children the infection of the vagina as well as the cervix makes it difficult to determine the point at which the patient is ultimately cured. Relapse after apparent cure is very common. Here again the absence of discharge and signs of inflammation of the vulva, vagina, and cervix are the first essentials.”

Following this come the same series of specimens for microscopic examination and culture as mentioned above for the adult, except that for the child rectal specimens also are advised.

Treatment of Chronic Gonorrhoea

A chronic gonorrhoeal discharge is due to persistence of the specific inflammation in one or more isolated areas. When such a discharge persists after the inflamed surfaces generally have returned to normal, make careful search for its exact source. The situations in which the inflammation is likely to persist are the following:

| | |
|---------------------------------|---------------|
| Skene's glands, in the urethra. | Cervix uteri. |
| Vulvovaginal glands or ducts. | Corpus uteri. |

In Skene's Glands.—When the gonorrhoeal inflammation invades these periurethral ducts, it may remain there indefinitely, causing symptoms of chronic urethritis or chronic cystitis and a persistent infective discharge. There is redness about the urethra and pouting outward of the swollen urethral mucosa. If the patient has passed through parturition, the opening of the duct on each side may usually be seen by rolling out the urethral mucosa, as explained under Examination in Chapter 2. If the duct is open, a drop of pus may be pressed from it. If the duct is closed, a small abscess forms.

To **treat** these conditions, the infected glands may be destroyed by excision or cautery or coagulation, using a small needle electrode, or the Corbus electrode with diathermy may be used for local heat treatment.

In Vulvovaginal Glands or Ducts.—Persistence of the gonorrhoeal inflammation in the duct of a vulvovaginal gland is indicated by reddening about the mouth of the duct and by a discharge from it, a drop of which may usually be pressed out. Microscopic examination of this discharge usually shows

gonococci in abundance, though in some old cases they may disappear temporarily. If the gland shows evidence of chronic involvement (firm nodule in that situation) it requires extirpation, for as long as it remains it prevents complete cure and the discharge from it is a source of danger.

If an abscess forms, the treatment suggested by Goldberger and Lapid should be tried. The vulva is cleaned with soap and water and an 18 gauge needle is introduced into the abscess from the mucosal side and the pus is aspirated. Then with the needle still in place, 200,000 units of penicillin in normal saline are injected slowly into the abscess cavity. A piece of cotton or gauze is held over the puncture wound for several minutes to prevent leakage. Immediate relief of the tenderness and a subsidence of the inflammatory process within twenty-four hours were obtained by this method. If this is not successful, the abscess is opened widely and packed with a small gauze drain to keep it open for twenty-four hours. If the lining has been destroyed by the infection, healing by granulation may be complete, but if there are repeated recurrences, the gland and the surrounding involved tissue should be extirpated. A vaginal cream containing sulfa drugs should be used to prevent extension to the vagina and cervix. Persistent inflammation at the vaginal vault is due usually to an irritating and infective discharge from the cervical canal. The chronic uterine infection may be located in the cervix or in the body of the uterus. When there is persisting inflammation at the vaginal vault without involvement of the cervical canal, the cervical discharge being clear mucus, suspect trichomonas vaginitis or other type, and investigate and treat accordingly. Persistent infection in the cervix should be treated by diathermy with a Corbus electrode, and if this is not successful, conization, as outlined under chronic cervicitis (Chapter 6), should be done.

Chronic salpingitis is discussed in Chapter 9 under Chronic Pelvic Inflammation.

GONORRHEA IN CHILDREN

Gonorrhoeal infection in female infants and children is more frequent than is generally appreciated. Most of the infections are due to accidental contamination from soiled clothing or toilet seat or from the fingers of the mother or attendant. The diagnosis should be made by culture and fermentation, as it is very difficult to differentiate the *Micrococcus catarrhalis* and *Neisseria sicca* from the gonococcus by ordinary staining methods.

The inflammation usually stops in the vagina. Extension upward to the tubes and peritoneum is infrequent but occasionally occurs. This should be kept in mind as a possible etiologic factor in obscure cases of peritonitis in children and also in tubal occlusions found later in life without apparent cause. Gonorrhoeal vaginitis in early childhood may cause adhesions of the vaginal walls, which obliterate the vagina to a greater or less extent. Such condition seen in later life may be mistaken for a congenital atresia of the vagina.

Treatment

The treatment of gonorrhoeal vulvovaginitis in children has gone through many phases, among which were repeated application of antiseptics locally,

diathermy applied by means of a Corbus electrode, Pyridium or sulfa drugs by mouth, and administration of estrogens locally or by mouth.

Before the advent of the sulfa drugs the estrogenic therapy gave the most consistent results. This consisted in building up a mature type of vaginal mucosa by administration of estrogens which was resistant to the gonococci (Figs. 260 to 264). It is still used in patients who cannot take the sulfa drugs or antibiotics or in resistant cases it may be used in combination with these therapeutic agents.

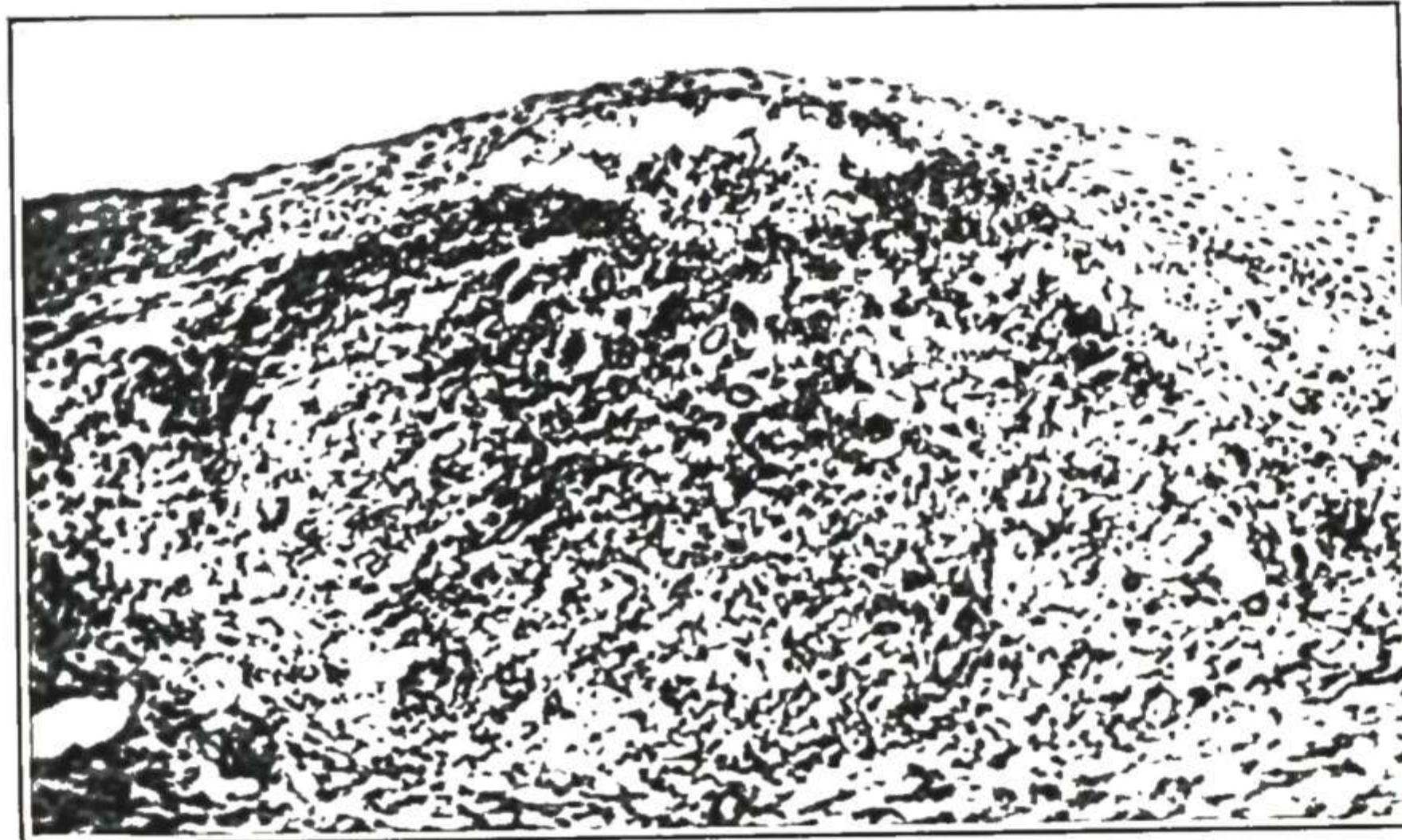


Fig. 260.—Gonorrheal vaginitis in a child. Note the immature, ineffective epithelial covering of the vagina. (From Te Linde: *Am. J. Obst. & Gynec.*)



Fig. 261.

Fig. 261.—Estrogen effect in building up a protective epithelium and eliminating infection, in an immature vagina.



Fig. 262.

Fig. 262.—Same case, showing return to normal immature epithelium after cessation of the estrogenic treatment.

(From Te Linde: *Am. J. Obst. & Gynec.*)

The most effective treatment today is penicillin therapy. A dose of 300,000 units of penicillin procaine G in an aqueous solution given as a single dose intramuscularly will usually cure in twenty-four hours. Some recommend 200 units per pound of body weight every three hours for six to eight doses. As has been mentioned, in some resistant cases estrogenic therapy is used in ad-

dition to the antibiotics. If oral aureomycin is preferred, 1 gram may be given three times a day for adults with a total of 3 to 6 grams. In children give 750 mg. for three doses (Chen, Dienst, and Greenblatt).

Schauffler noted that in some cases the cervix acts as a persistent site of infection. Examination with a Kelly endoscope using a head mirror for light will enable one to determine whether the cervix is infected, and local treatment may be given through this instrument. Though this condition is rarely seen now with adequate treatment, it was formerly not an infrequent complication of gonorrhoea in children.

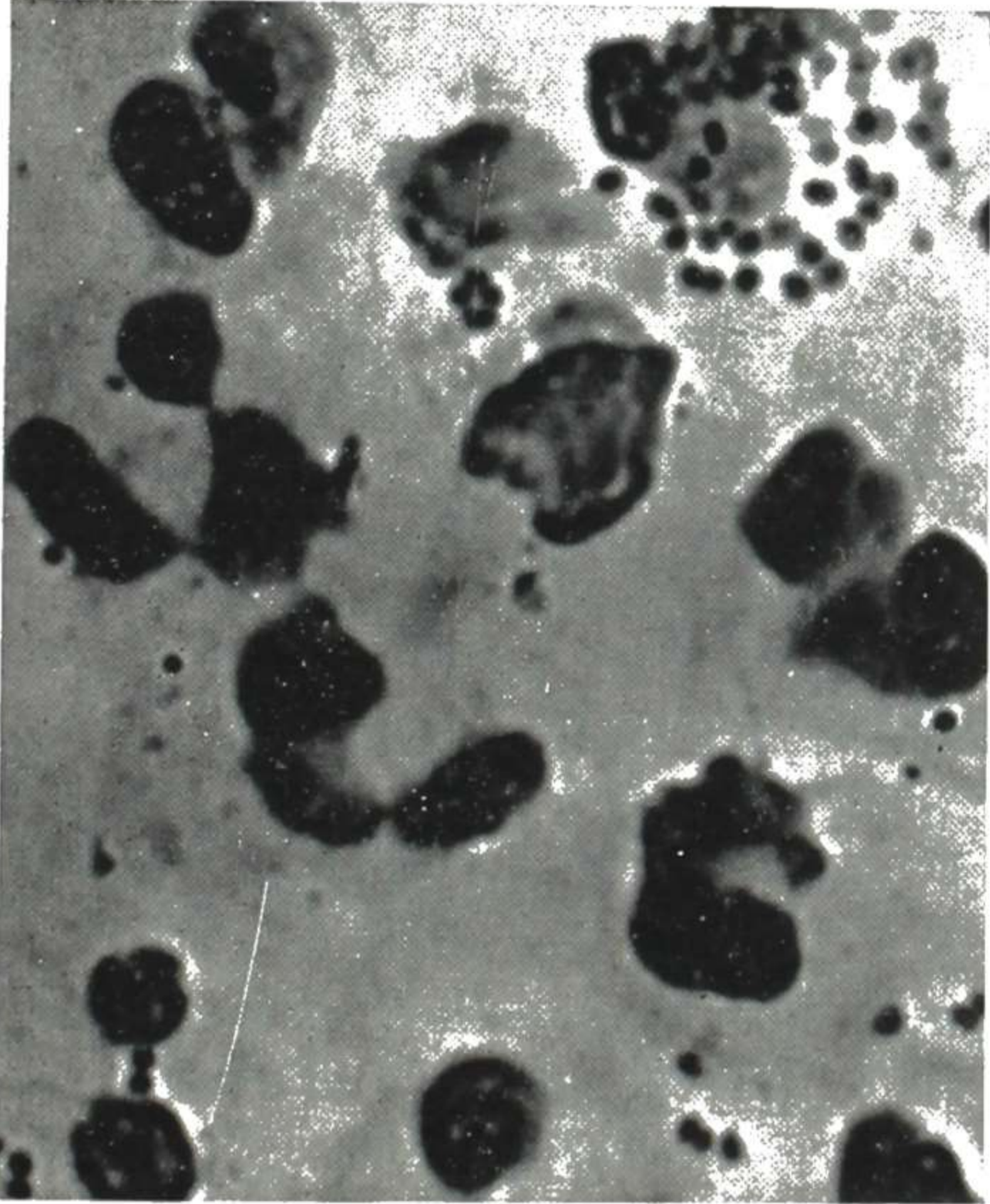


Fig. 263.

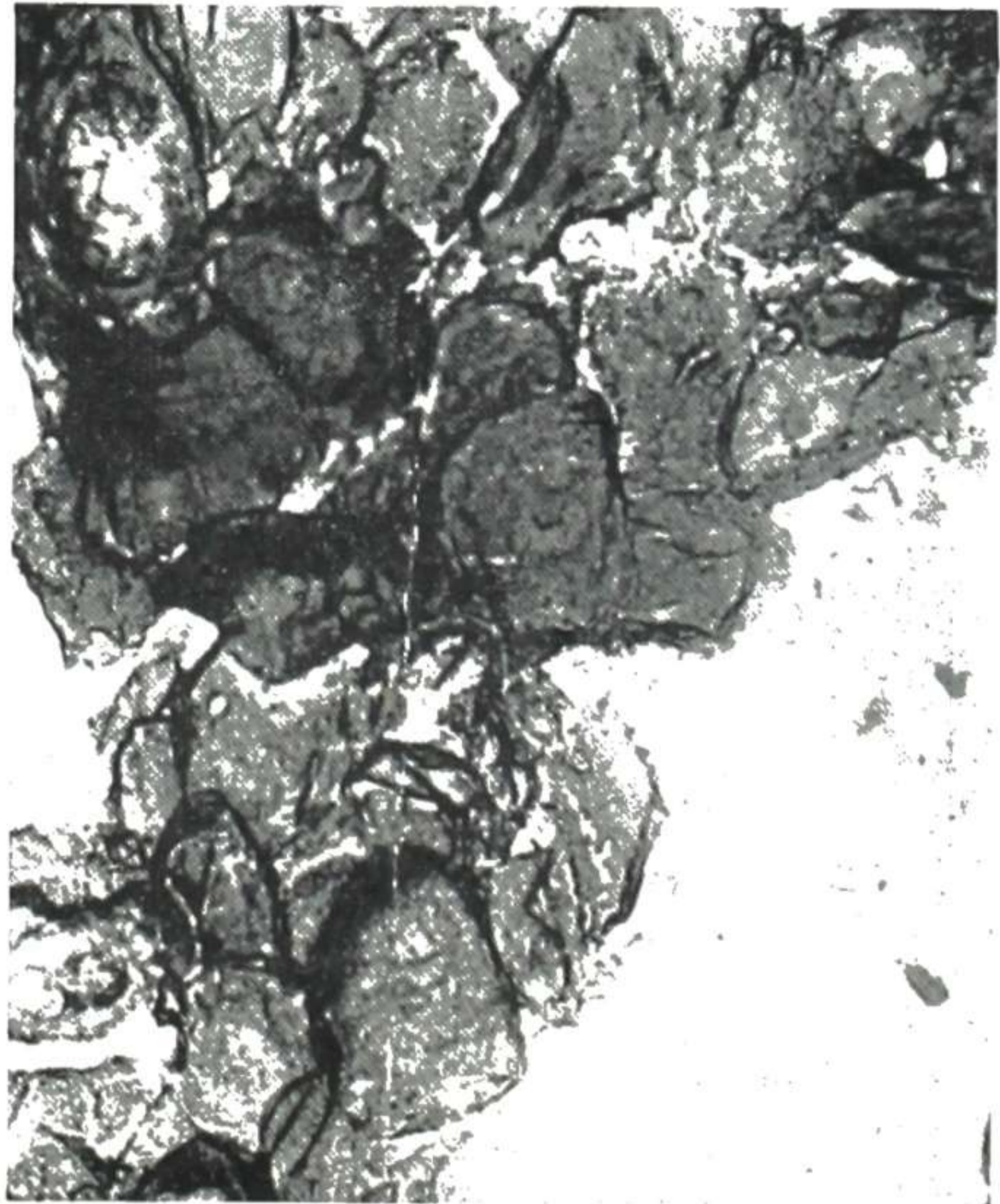


Fig. 264.

Fig. 263.—Vaginal spread in a case of gonorrheal vaginitis before treatment.

Fig. 264.—Vaginal spread in a normal immature vagina after treatment. No bacteria or pus cells.

(From Te Linde: *Am. J. Obst. & Gynec.*)

GONORRHEA AFTER THE MENOPAUSE

In gonorrheal vaginitis after the menopause, the same problem of dealing with a thin nonprotective epithelial covering due to lack of estrogen hormone is encountered, and the same treatment with vaginal suppositories is beneficial in taking care of this factor in the situation. This is used, of course, in combination with the regular antibiotic therapy.

DISEASES OF THE VULVA

PRURITUS VULVAE

Pruritus vulvae is not a disease but a most distressing symptom characterized by severe itching of the vulva and frequently of contiguous areas of skin on the perineum and about the anus. It may be due to local or general causes.

The many etiologic factors involved may be divided into the predisposing causes, the general causes, constitutional diseases or deficiencies, allergy, and local causes:

1. According to Hailey the predisposing cause of pruritus is an inherited hypersensitivity which causes the patient to react to a direct or an exciting cause.

2. General factors listed by Bacon are overwork, worry, alcoholism, and psychic disturbances. The psychogenic causes enumerated by Jeffecoate are masturbation, cancerphobia, venereophobia, guilt complex, and marital disharmony with an underlying desire to avoid intercourse.

3. The constitutional diseases and deficiencies which were found to be commonly associated with pruritus vulvae by Parks and Martin were diabetes, blood dyscrasias, and vitamin deficiencies, especially vitamins B, D, and A. Others are thyroid and ovarian deficiencies, liver disorders with icterus, and uremia.

4. Allergic reaction may be inherited, as mentioned above, or a sensitivity may result from prolonged or repeated use of drugs or other substances. Recently it has been discovered that penicillin, aureomycin, and some of the other antibiotics are not infrequently responsible for eczematoid dermatitis. Behrman, Nayfield, and others have reported monilial infection of the vulva and vagina as a result of aureomycin administration.

5. Local causes of pruritus vulvae are irritating vaginal discharge, urinary infections, sweating and friction, congestion and edema of the vulva, parasitic infestation, pin worms, skin diseases, and leukoplakic vulvitis.

Symptoms.—The patient complains of an intense itching about the genitals. It may be confined to the clitoris, labia, or vestibule, or it may involve all these structures and also adjacent regions, for example, the vagina, anus, and inner sides of the thighs. The itching and burning may be practically continuous, but more often it is intermittent in character. It may disappear spontaneously for several hours or days or even longer, only to return as suddenly as it disappeared. Congestion at the menstrual period or during pregnancy may increase the pruritus. Irritating articles of food and also alcoholics often have the same effect. The warmth of the bed usually makes the itching worse; consequently the patient may lose much sleep.

Frequently the distressing symptoms persist in spite of local and general sedatives and in some cases they become intolerable, making the patient's life a burden to her. On account of the irresistible tendency to scratch or rub the parts, the skin becomes irritated and abraded and inflamed. Deep fissures may form and in some cases a discharging or weeping surface develops. The constant suffering makes the patient irritable and nervous.

Treatment.—This consists in determining the cause and correcting it. Examination of the urine will rule out diabetes and urinary infection. History and general examination with blood examination will rule out a systemic cause for the pruritus. Skin diseases such as psoriasis and lichen planus usually have a general distribution, enabling one to differentiate them from local skin lesions. After ruling out the common causes such as mycotic and other diseases of the vulvar and rectal skin, furunculosis, pin worms, leukorrhea, and others, allergic reaction to drugs or external irritants should be suspected. Certain ma-

terials in the underwear or pads may be the factor; other materials which may cause irritation are contraceptives, soaps, salves, home remedies, and powders. All medicaments which the patient has been using are discontinued, and contact with wearing apparel of wool or with other material to which the patient may be sensitive is avoided.

It is important to prevent scratching as this usually results in trauma and secondary infection, complicating the treatment of the original condition. The parts are cleaned with nonallergic soap or with pHisoderm, or, if markedly irritated, with olive oil. Cool compresses of 1:10,000 potassium permanganate or aluminum acetate solution (N. F.), diluted 1:20, will control the itching. Following the cool compress, witch hazel gently daubed on the affected skin areas or a dusting powder freely applied will usually give the patient relief for the night. A good dusting powder is as follows:

| | | |
|------|--------------------------------|-----|
| R | | GM. |
| | Bentonite | 30 |
| | Talc | 10 |
| | Magnesium carbonate | 30 |
| | Magnesium stearate q.s. ad. | 100 |
| M. | Mix and sift. | |
| Sig. | Dust affected parts liberally. | |

Ballentine suggested a simple treatment which gives prompt relief while the cause of the pruritus is being sought. An electric fan is placed on a table at the foot of the bed and directed toward the perineum for thirty minutes, and this is repeated several times during the day. The area is kept clean by means of a cool sitz bath once or twice a day, the vulva being dried by gentle sponging with soft tissue.

Salves containing local anesthetics, while they sometimes give temporary relief, may cause more irritation. Antihistamines may be given by mouth or in the form of creams or ointments. This, of course, does not cure, but by eliminating scratching it allows the inflammatory reaction of the skin to clear up. Feinberg and Bernstein obtained relief in 24 of 33 patients suffering from eczema, many of whom had had no relief from other treatments, by using Pyribenzamine cream locally and oral Pyribenzamine 50 mg. four times a day.

If after a careful history and examination no cause for the pruritus is found, a psychosomatic factor should be suspected. Usually, helping the patient to gain an insight into her problem and assurance, plus some bland local application such as the formula above, cause the pruritus to clear up. For severe cases Beinhauer et al. advise intravenous use of 0.1 per cent procaine hydrochloride in 500 c.c. of saline with 200 mg. of ascorbic acid.

In persistent cases more radical therapy is occasionally required, and for these x-ray therapy under expert management may give relief. If marked leukoplakic vulvitis is present, excision is required. In cases of persistent itching without apparent tissue change, and without endocrine or allergic cause, local injection treatment may be tried.

Wilson gives a most instructive report on the treatment of pruritus vulvae by means of subcutaneous injections of 2 to 4 minims of 95 per cent alcohol at many points over the involved area. Fig. 265 shows the points of injection on the right side in one case. Forty-nine cases of pruritus vulvae, most of them

persistent in spite of other measures, were treated. The results attained were remarkable, and they indicate trial of this measure in persistent cases without removable cause. Full details of handling the patients are given in the article.

Jacoby reports a series of patients treated with local alcohol injections. Turell reports the successful treatment of recurrent pruritus, in adjacent areas after vulvectomy for leukoplakic vulvitis, by tattooing (puncturation) with mercury sulfide. Fantus and Cornbleet take up in a very thorough way the various features of pruritus treatment as it is carried out in the Cook County Hospital.

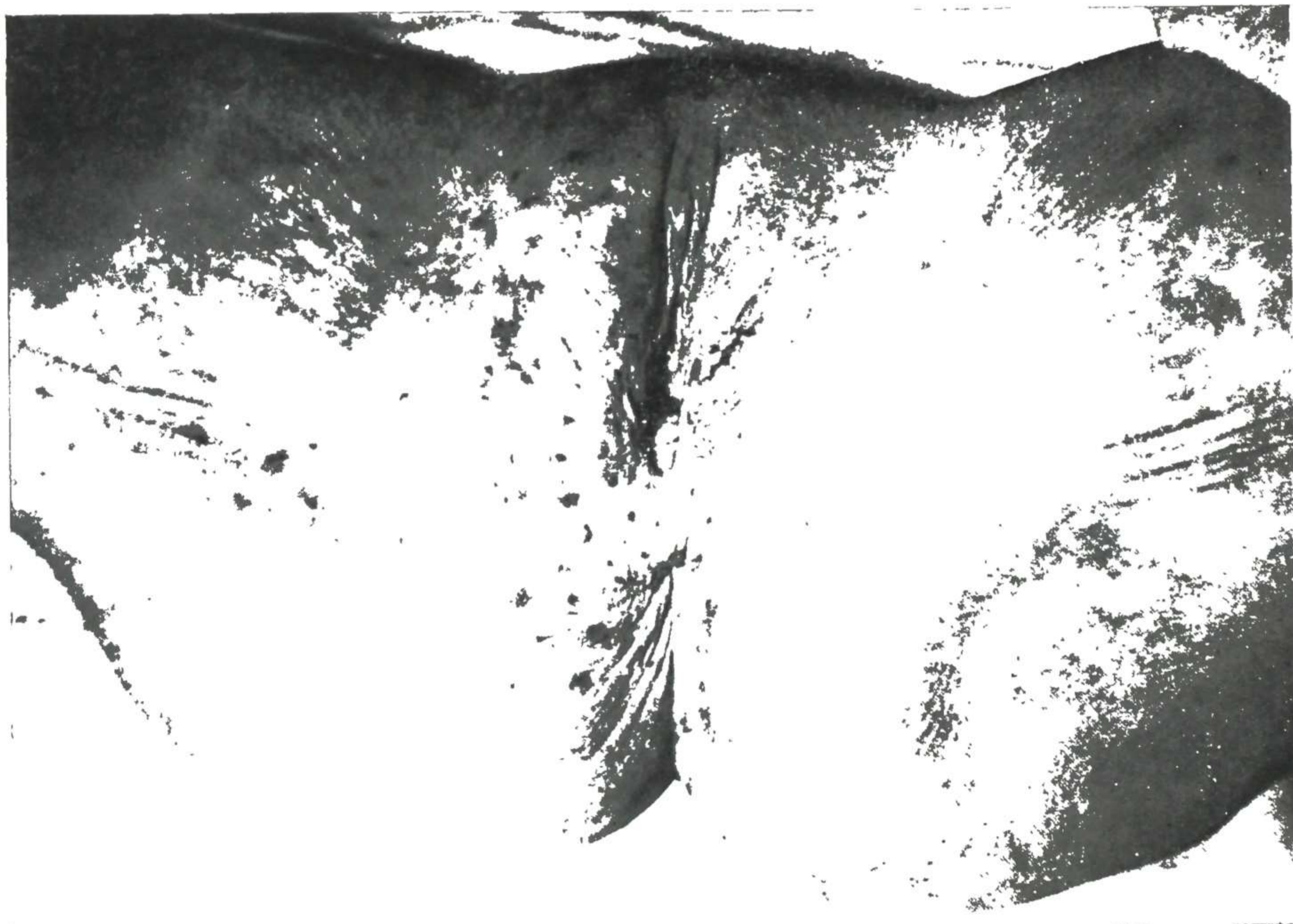


Fig. 265.—Pruritus and chronic dermatitis of the vulva and contiguous structures of two years' duration in a woman aged seventy years. For photographic purposes the site of each alcohol injection on the right was marked with indelible ink. Because of impaired circulation a minimum amount of alcohol (2 minims) was injected at wider intervals than usual. The multiple injections, thus depicted, relieved the pruritus promptly and caused the dermatitis to disappear within a week. Although there has been an occasional mild recurrence during the past three years, reinjection has not been necessary. (From Wilson: J. A. M. A.)

Resection of the nerves may be tried. The local nerve supply to the pruritic areas may be attacked by subcutaneous division immediately under the affected skin, recommended by Mering, or by division of the internal pudic nerve as it leaves the protecting tuberosity of the ischium. Care must be taken that the innervation of the rectum be not damaged, with resulting incontinence of feces.

OTHER TYPES OF VULVITIS

In addition to inflammation of the external genitals due to the gonococcus, there are other inflammatory disturbances which occur in this locality, such as intertrigo, eczema, herpes, bacterial infections, parasitic skin diseases, and that atrophic condition designated leukoplakic vulvitis.

Intertrigo

Intertrigo is a hyperemic condition of the skin, with slight maceration and consequent irritation. The patients usually refer to it as a "chafing" or "heat." It is due to prolonged contact and friction of opposed surfaces. The normal skin secretions are retained between the approximated surfaces and

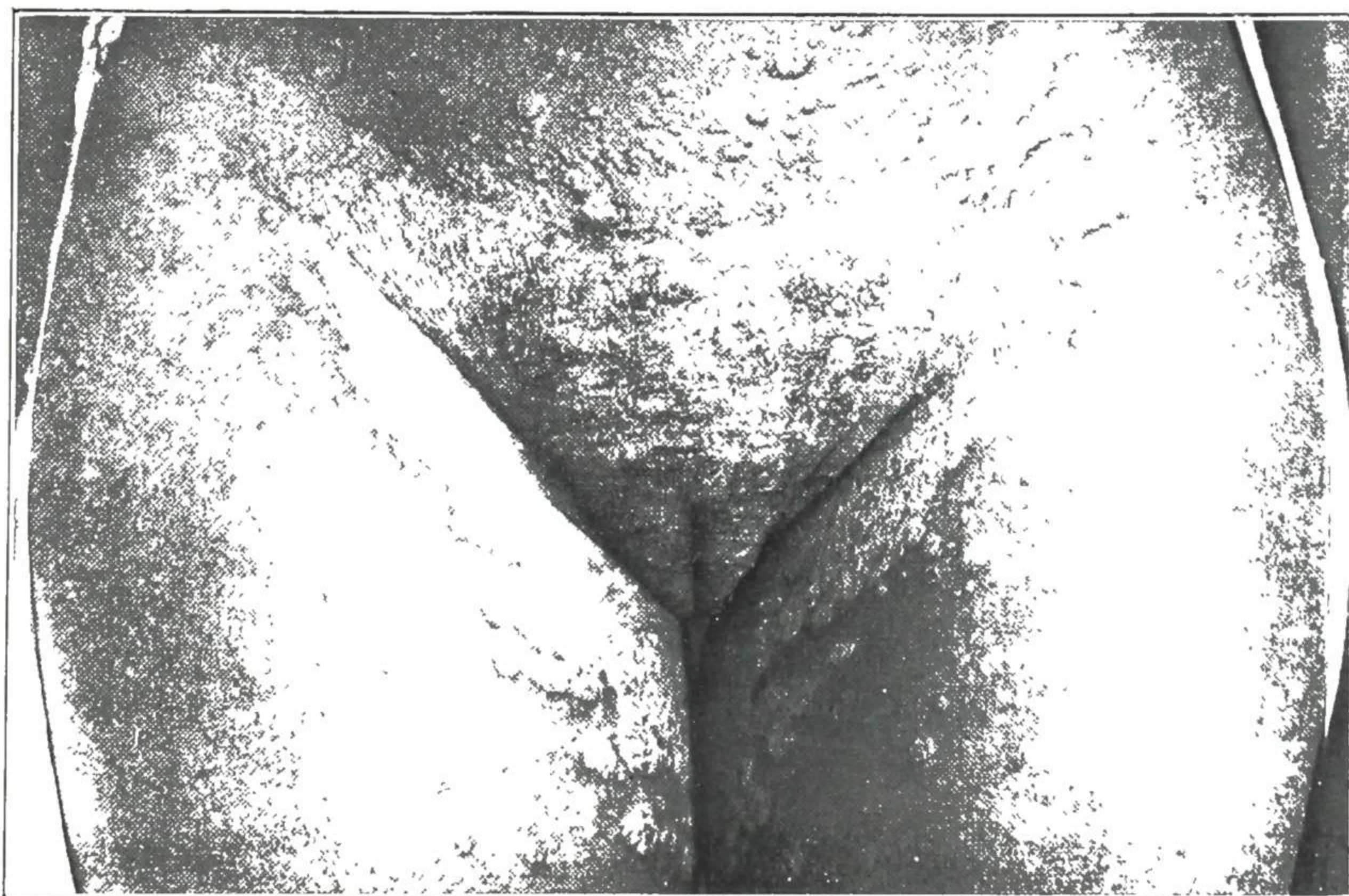


Fig. 266.—*Tinea cruris*, showing extensive involvement. The parasitic and inflammatory lesions about the external genitals produce some troublesome diagnostic problems. (From Sutton and Sutton, after Mackee: Diseases of the Skin, The C. V. Mosby Co.)



Fig. 267.—Microscopic characters of common pathogenic fungi. *Trichophyton gypsum*. Spirals are characteristic of *T. gypsum*. (From Dr. George Lewis and Dr. Mary Hopper, New York Skin and Cancer Unit.)

become decomposed and irritating. It occurs most frequently in stout women and in infants, because in them the skin surfaces are in contact more constantly and over a wider area. It is aggravated by vaginal discharge and is usually worse in hot weather.

It is most often located in the genitocrural creases, but may spread inward over the labia or outward over the thighs and upward on the abdominal wall. At first, intertrigo consists simply of hyperemia and slight irritation of the skin, but may soon become complicated with monilia (thrush), or by trichophyton implantation (Figs. 266 and 267).

The treatment consists of cleansing and soothing applications, such as 10 per cent Argyrol, the free use of a drying powder to eliminate moisture between opposed surfaces, and special measures required for any complication such as thrush infection or trichophytosis or eczema. In severe cases (probably complicated) Tulipan obtained best results by spraying the parts with a 5 per cent solution of tannic acid through an atomizer. This was applied two or three times daily. If there was much secondary infection, he used a spray of 2 per cent solution of brilliant green over the tannic acid. He found relief usually immediate, and the condition cleared in a few days.

A dusting powder of equal parts of boric acid, zinc oxide, and talc will help to prevent recurrence.

Eczema

Vesicular eczema of the vulva is most frequently located on the labia majora. The vesicles break and form crusts, and an itching, inflamed discharging surface persists. Chronic erythematous and squamous eczema also may occur, in which case the skin is infiltrated and may become nodular. The eczema may be limited to the vulva or it may extend to the adjacent cutaneous surfaces or into the vagina.

The causes and symptoms and treatment of eczema of the external genitals are practically the same as for eczema elsewhere.

The first step in the treatment is to eliminate the factor causing the eczema if this can be determined, such as soap, medications, or irritation from clothing. The itching can be controlled by cold packs of 1:10,000 potassium permanganate, after which a soothing ointment such as Lasser's paste should be applied. For cleansing the surface, detergents are preferable to soap, and if markedly irritated, a bland oil should be used. Antihistamine therapy has been mentioned under Pruritus Vulvae.

Herpes

Herpes may occur on the vulva, where it is known also as "herpes pro-genitalis." The vesicles of the herpetic eruption are usually of larger size than those of vesicular eczema. Furthermore, they occur in groups and do not rupture easily, whereas the vesicles of eczema rupture spontaneously, causing a sticky discharge. Herpes is seldom accompanied by the intense burning and itching which characterize eczema. Herpes occurs especially in nervous women, particularly when there is marked pelvic congestion from any cause. With some women it occurs at nearly every menstrual period.

The discomfort from uncomplicated herpes is so slight that not much treatment is required. The parts should be kept clean and dry and may be dusted frequently with some drying powder, for example, equal parts of zinc oxide and prepared chalk. All irritation should be avoided. If there is troublesome pruritus or burning or smarting, a bland lotion or ointment may be used.

Bacterial Infections

Staphylococcus and streptococcus infections may occur about the external genitals, either localized to the skin glands or as a diffuse process as in erysipelas or cellulitis.

Follicular vulvitis occurring in adults is characterized by the inflammation being confined principally to the hair follicles and sebaceous glands. The inflamed structures are represented by small red tender papules scattered over the labia somewhat on the order of local acne or furunculosis.

Erysipelas of the vulva, like erysipelas elsewhere, is a rapidly spreading inflammation produced by the *Streptococcus pyogenes*. In the beginning there is usually a chill, followed by considerable fever, and the general disturbance usually associated with fever. The patient complains of heat and throbbing in the external genitals. The fever continues and swelling of the vulva is noticed. The patient then comes for examination. In the diagnosis, differentiate from scarlatinal rash on vulva, from intertrigo, from bichloride rash, from cellulitis of vulva, and from hematoma.

Cellulitis of vulva is that form of vulvitis caused by ordinary pus bacteria (usually the *Staphylococcus pyogenes aureus* or *albus*) penetrating to the subcutaneous connective tissue and causing inflammation there. It is known also as "phlegmonous" vulvitis and as "lymphangitis" of vulva. It lacks the superficial parchmentlike induration of erysipelas.

Anything that causes an abrasion about the vulva, through which bacteria may reach the connective tissue, may lead to phlegmonous vulvitis. Any of the previously mentioned forms of vulvitis may be followed by this form. Injuries to the vulva or furunculosis may lead to the same. The pathologic changes are the same as in cellulitis elsewhere.

Gangrenous vulvitis is known also as "noma." It is inflammation of the vulva of such severity that the nutrition of the structures is cut off and they become gangrenous. Extensive sloughing may take place.

Gangrenous vulvitis occurs almost exclusively in patients in whom the normal tissue resistance has been destroyed by exhausting general or local diseases. Local conditions interfering with the pelvic circulation, such as pregnancy and pelvic tumors, predispose to this affection.

Its most frequent victims, however, are children who are poorly nourished and poorly cared for. In such it is often fatal. The exanthemas, particularly when occurring in sickly children, may cause gangrenous vulvitis. Diphtheria infection, which occasionally is located about the genitals, may lead to sloughing unless recognized and treated promptly.

Treatment.—In the treatment of these bacterial invasions of the external genitals, the determination of the cause or type of infection is the important step, for that indicates the type of treatment required in that particular case.

In the mild cases, a soothing local application and the use of a lactic acid douche to remove any irritating discharge may be all that is required. A wet compress of 1:20 aluminum acetate solution will usually give relief. Where there is definite infection, bacitracin or tyrothricin or aureomycin ointment should be tried and, if there is no response, sulfathiazole cream should be used cautiously. In some cases it is necessary to use 3 per cent ammoniated mercury. If cellulitis is present, the antibiotics should also be administered intramuscularly, as in other types of severe infection.

Weinstein reported a case of Plaut-Vincent cervicitis and vaginitis and reviews the literature on this subject. The vagina was covered with a dark gray membrane and numerous ulcers were present. There was a thin seropurulent discharge with a fetid odor. A smear was laden with the fusospirochetal organisms of the Plaut-Vincent type.

The treatment recommended consists of removal of the membrane and application of gentian violet or sodium perborate locally in the acute stage and later application of arsphenamine or neoarsphenamine in glycerin locally. Genital infection with this organism is rare; up to 1945 when Weinstein reported his case there were only 32 cases in the literature.

Parasitic Infections

Trichophytosis of Vulva (Tinea of Vulva, Tinea Cruris).—This is one of the four ordinary parasitic diseases of the skin, the other three being moniliasis, pediculosis, and scabies. These parasitic invasions occur about the external genitals as elsewhere on the body surfaces. They give rise to much irritation and, unless search is made for the fungus or other parasite, the patient may be treated ineffectually for a long time.

Trichophytosis or tinea vulvitis is ringworm of the genitocrural region, which masquerades under a variety of designations. It is due to the tinea trichophytosis or large-spored ringworm fungus, of which there are several slightly different varieties. The variety most frequently found here is the epidermophyton, hence the affection has been termed "epidermophytosis inguinale." In tropical countries, where it is more frequent and severe, it is often designated "dhobie itch," to indicate its origin from contamination of clothing in laundry operations ("dhobie" meaning laundry).

Trichophytosis of vulva should be suspected whenever a mild dermatitis of the vulva and adjacent portions of the thighs resists cleansing antiseptic and drying treatment, especially if spreading by a well-defined margin. If allowed to persist it may become extensive, as in Fig. 266. The usual method of examining for the skin fungi is to put some scraped-off scale on a microscopic slide, add a small drop of 10 per cent potassium hydroxide solution, put on a cover glass, and examine for the mycelium and spores, stopping down the light to give outlines. Trichopyton fungi are shown in Fig. 267.

Blumenthal and Snow call attention to the fact that fungus does not always show in this direct examination, and advise cultures and describe a rapid and convenient method.

As to **treatment**, an effective antiseptic and antipruritic solution is the compound resorcinol lotion (mercuric chloride, 0.18; resorcin, 9.0; 70 per cent

alcohol, q.s. ad. 180 c.c.). The temporary smarting is usually followed by prolonged relief from the pruritus. Rubbed into the affected surfaces night and morning, it stops the growth of the fungus and eventually eradicates it, though skin irritation or possibly bichloride absorption from prolonged use on large surfaces are to be kept in mind. If talcum is used, watch to see if the patient is allergic to the powder employed. After the acute stage a solution containing 1 per cent salicylic acid in witch hazel is used to clear up any persisting lesions.

In combination with the lotion the following ointment may be applied at night:

| R | Gm. |
|-----------------------|------|
| Pine tar ointment | 1.2 |
| Salicylic acid | 2.4 |
| Precip. sulfur | 4.8 |
| White petroleum jelly | 60.0 |

Sig.: Apply as directed.

Many preparations which are in common use for treatment of epidermophytosis elsewhere in the body, such as the undecylenic preparations, are too irritating for the vulvar skin.

The varied lesions of epidermophytosis and the accompanying dermatophytids (specific skin reactions to tinea products) and dermatitis from prolonged application of tinea acids may create such a complex clinical picture that special dermatological study is necessary for differential diagnosis and successful treatment; hence the advisability of consulting a systematic work on dermatology in any resistant case.

Moniliasis of Vulva (Diabetic Vulvitis).—*Monilia* (yeast fungi) and *Mycoderma* (Fig. 268) invade the vagina and external genitals when conditions are favorable. Mild skin irritations such as intertrigo in children favor such invasion. The diagnosis is confirmed by finding the mycelium and spores of the yeast fungus (Fig. 267) in a microscopic specimen prepared as just explained for showing the trichophyton fungus. The **treatment** is the same as given for *monilia vaginitis*, with which it is usually associated.

In diabetic individuals the excretion of sugar in the urine favors the growth of yeast fungi and often leads to marked vulvar irritation and pruritus. Diabetic vulvitis presents a characteristic glazed edematous appearance, with uniform redness but no ulceration or papules or other circumscribed lesion to account for the burning and itching.

Examination of the urine shows sugar, and the vulvitis will continue until it is cleared. In all persisting pruritic conditions about the genitals, the urine should be carefully checked for sugar or other substances that may irritate the surfaces. Hesseltine has emphasized that *monilia* infection is an important factor in the distressing vulvitis of diabetics, and he was able to make a mild *monilia* infection in a nondiabetic patient worse by applying glucose to the vulva.

Cold packs of 1:20 aluminum acetate solution (N.F.) will allay the itching until the urine can be made sugar-free.

An ointment which gives good results in these monilial vulvitis cases is **Naprylate** (Strassenburgh).

Pediculosis Pubis.—Pediculosis pubis is an infrequent parasitic disease of the vulva. The pediculus pubis or "crab louse" (Fig. 269) differs from the pediculi found on other parts of the body. It inhabits the pubic hairy region and may give rise to much irritation. It is conveyed from one person to another by contact, usually in sexual intercourse, or from bedclothes or clothing.

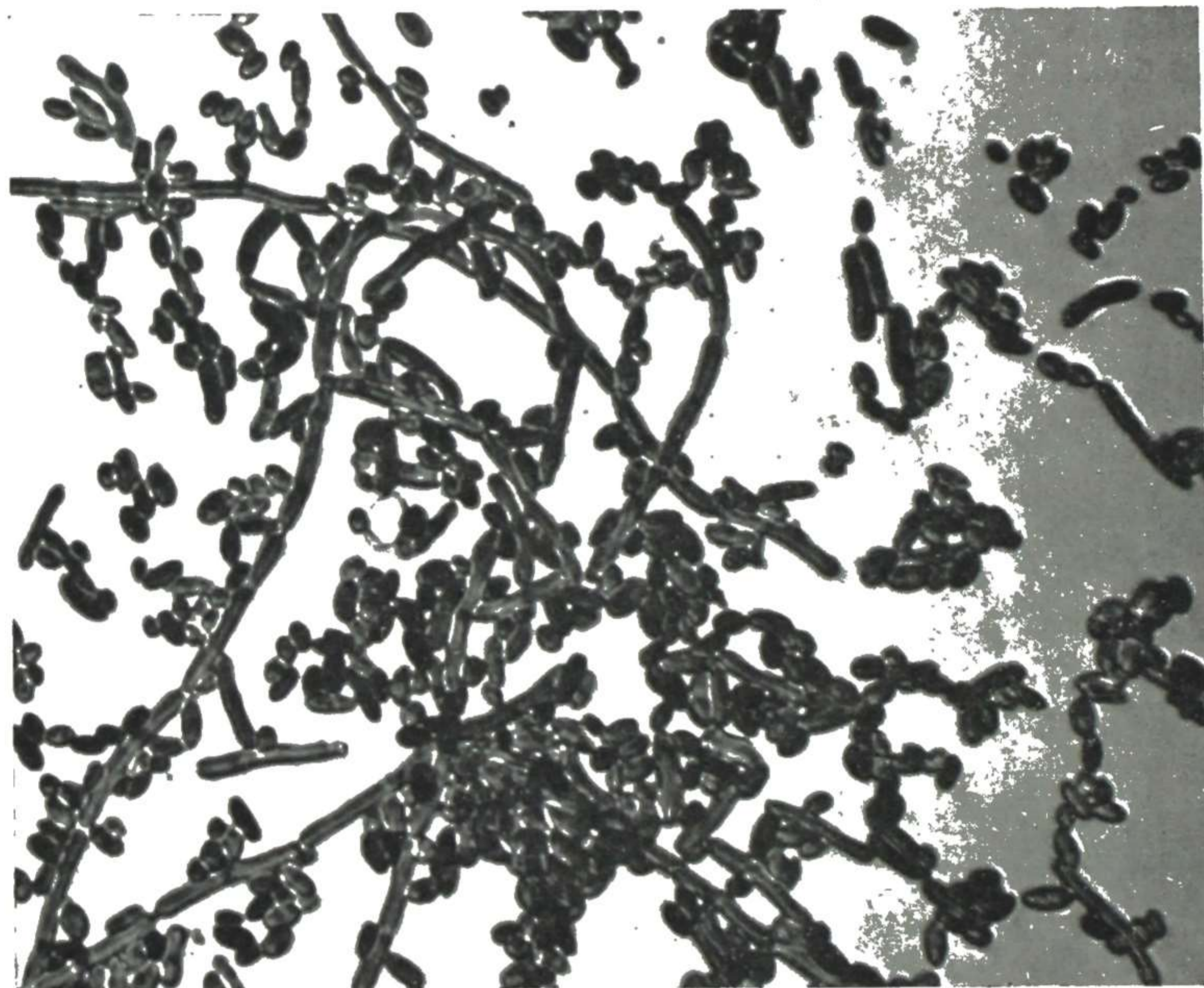


Fig. 268.—Photomicrograph of Mycoderma. Suspension made from a colony grown on Sabouraud's medium. Methylene blue stain. ($\times 450$.) (From Campbell and Parrott: *Am. J. Obst. & Gynec.*, May, 1950.)



Fig. 269.—The pediculus pubis, magnified. (From Stelwagon: *Essentials of Skin Diseases*, W. B. Saunders Co.)

There is itching and consequent scratching, with resulting abrasions and vulvitis. The diagnosis is made by finding the parasites, which are attached to the hairs near the skin. At first they may not be noticed, but on close inspection they are seen as small brownish particles attached to the hairs very close to the skin.

In regard to the parasitic infections of the vulva, the older treatments have been supplanted by more efficient and less messy methods of treatment. For pediculosis pubis, the patient is instructed to powder the pubic area thoroughly with 5 per cent DDT, daily for three days. In cases where this does

not kill the mites, Cuprex solution (Merck) rubbed in thoroughly will usually be effective. Hurlbut et al. found that in Korea many of the lice have become resistant to 10 per cent DDT.

Scabies.—Scabies may appear about the external genitals as part of an extensive development of scabies, the infection usually appearing first on the fingers. There are the usual symptoms—severe itching, worse when the body is warm, and the abrasions and irritation resulting from scratching. The diagnosis is made by finding the burrows of the itch mite on other portions of the body, usually on the fingers.

Prior to the introduction of benzyl benzoate, the treatment of scabies consisted of the use of ointments and salves which were left on for several days. Nielsen and Kissmeyer treated 8,000 patients with a single application of benzyl benzoate emulsion and claimed uniformly good results. Robinson found that in cases in which there was a superimposed pyoderma, a benzyl benzoate tyrothricin mixture was more effective than either alone; the formula he used was manufactured by Sharp & Dohme under the trade name of Tyroscafe. The blisters were opened and washed with warm soap and water, then dried. The application was made on two successive days, and then the patient took a warm bath. Sixty-nine of the 71 cases were cured within five to fourteen days. Cannon and McRae report excellent results using hexachlorocyclohexane (Kwell) in a vanishing cream base. There are several excellent commercial ointments on the market which eradicate the parasite in one treatment. The ointment is applied to the entire body immediately after a warm bath and left undisturbed for twenty-four hours and then removed by taking a bath to remove the ointment; the bedding and the clothes are completely changed to prevent reinfection. Kwell (Commercial Solvents), a gamma isomer of benzene hexachloride in a 5 per cent vanishing cream base, is one of the most effective.

Leukoplakic Vulvitis

Leukoplakic vulvitis is an affection of the external genitals characterized by whitening and atrophy and shrinking of the skin, with obliteration of the normal folds and a change in the consistency of the epidermis by which it becomes inelastic and parchmentlike and cracks easily.

Under "atrophic diseases" of the vulva are classed leukoderma (vitiligo, pigment atrophy, "white spots") and leukoplakic vulvitis (atrophic sclerosis, chronic atrophic vulvitis, kraurosis). Kraurosis is a term applied to a condition of marked contraction about the vulvar entrance. The word is derived from the Greek and means "shriveling up," and describes this feature of the lesion very well. This feature, however, may be due to different pathological conditions. It is only a symptom and hence is not a satisfactory term for a distinct disease. Leukoplakic vulvitis and other conditions presenting atrophy and contraction at some stage are still designated "kraurosis" in the literature of European countries but, as Taussig points out, the use of this old ambiguous blanket term serves only to confuse the picture and should be dropped.

As to **etiology**, leukoplakic vulvitis has in different cases been preceded by eczema and other chronic inflammatory diseases of the vulva, by pruritus

vulvae with resulting scratching and traumatism, by removal of the uterine appendages and by chronic vaginal discharge. It has been attributed to each of these conditions, but apparently none of them constitutes the essential factor in its development.

Age seems to be a definite factor in the etiology, for it occurs almost exclusively in women near or past the menopause. This would seem to indicate that it is connected with the senile atrophic changes and absence of ovarian hormones, but that does not explain why it occurs only occasionally. As cutaneous atrophy is such a marked feature, it has been surmised that it is due to an atrophic affection of the nerves of the parts. Marked changes in the nerves have been demonstrated, but whether such changes are primary or secondary is uncertain.

Pathology.—Taussig's investigations and accurate recording and analysis of extensive clinical experience with the disease have established leukoplakic vulvitis as one of the important diseases of the external genitals. It causes marked distress at various stages of its progress, effective treatment usually requires an extensive and particular plastic operation, and if allowed to persist it is very likely to eventuate in cancer.

The lesion is generally bilateral, being unilateral or asymmetric in only about one-third of the cases. When bilateral, it is usually symmetric and is present as a butterfly area of parchmentlike skin. In the early stages the skin is red, swollen, dry, and excoriated. In the second stage there is thickening of the skin and a flattening of the labial folds. There are white semiopaque patches on the skin. In the third stage the skin is parchmentlike, cracked, and a bluish white color. In the fourth and final stage there is a smooth white shiny skin, and a complete obliteration of all folds.

As to microscopic features, in the early stage there is a marked edema, round cell invasion, and increased vascularity. In the epithelial layer there is a marked prolongation of the papillae. Deposits of eleidin or keratohyalin are seen in the upper layers of the epithelium. The keratin layer is a little thicker than normal. One of the characteristic changes noted in this condition is the absence of the normal elastic fibers in the spaces between the papillae. This shows as a very light staining area.

In the later stage the epithelial layer becomes thinned out and the papillae are flattened. The keratin layer becomes markedly thickened and occupies from one-half to two-thirds of the epithelial layer. The basement layer of cells is not distinct as it is in the early stage but presents a frayed-out appearance. The tissue beneath the epithelium loses its cellular character. The elastic fibers are entirely absent in the affected area. In the cellular area there is a large amount of glairy, collagenous tissue containing some mast cells, plasma cells, and occasionally clumps of round cells. The microscopic characteristics are shown in Figs. 270 to 273.

As to **malignancy**, over half of the extensive series of vulvar cancer cases reported by Taussig had leukoplakic vulvitis as an etiologic factor. An example is shown in Fig. 276, and the matter is considered further later under vulvar cancer.

Symptoms and Diagnosis.—In the beginning there may be a low-grade inflammation appearing in spots just outside the vaginal opening on the labia.

As the disease progresses, the older portions lose their color and elasticity and become white and dry and crack easily and tend to shrink (Figs. 274 and 275). The atrophic contraction may progress to a marked narrowing of the vaginal opening, as shown in Fig. 276. The glandular structures (sweat glands,

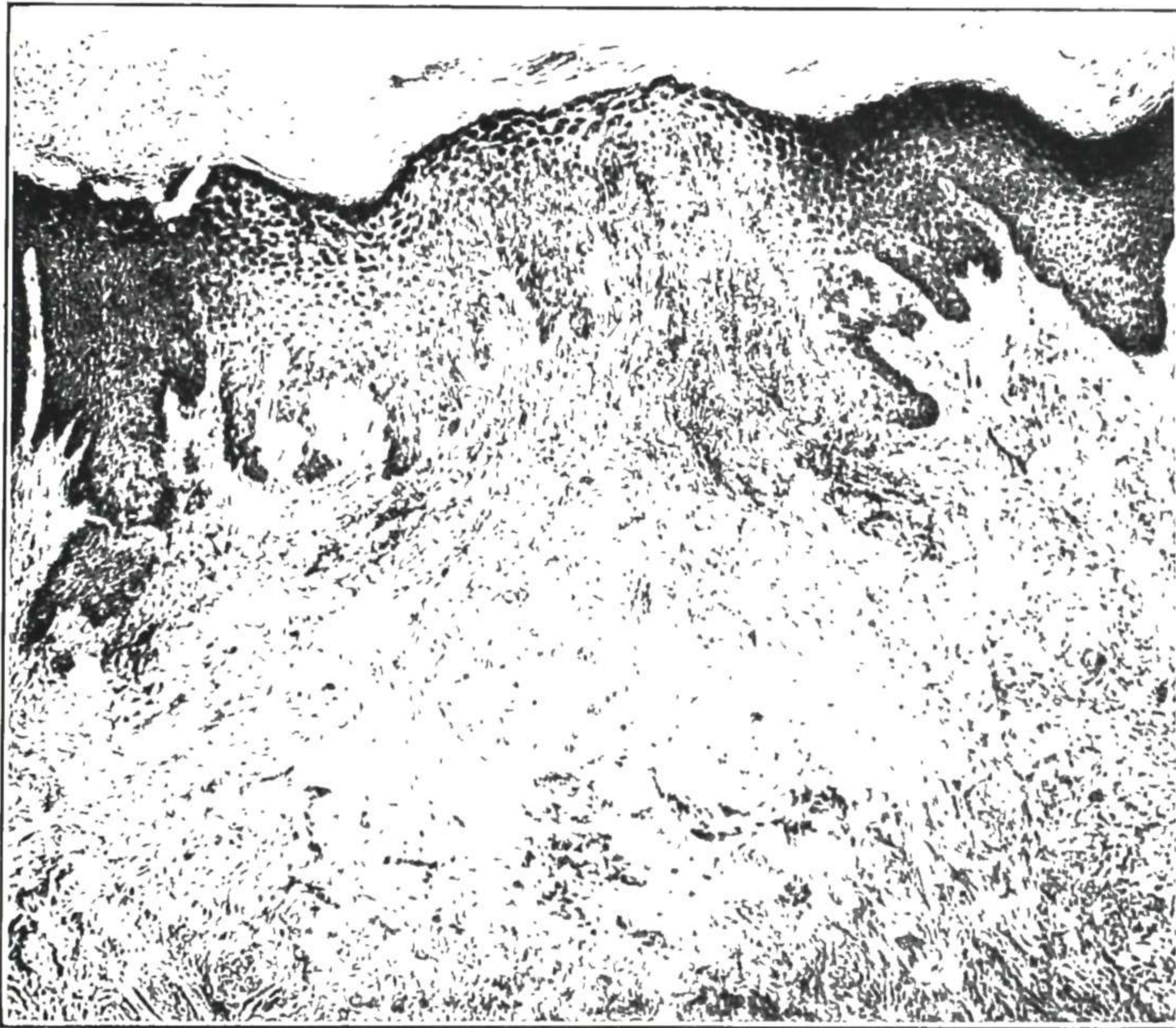


Fig. 270.—Leukoplakic vulvitis: hyperplastic stage. Note from above downward: first, the greatly thickened layer of keratin cells (hyperkeratosis); second, the increased number of eleidin cells, forming an almost black band; third, the granular zone sending long papillary processes of epithelium into the connective tissue (acanthosis); fourth, the connective tissue showing marked round cell infiltration, most marked directly beneath the epithelium (From Taussig: *Am. J. Obst. & Gynec.*)

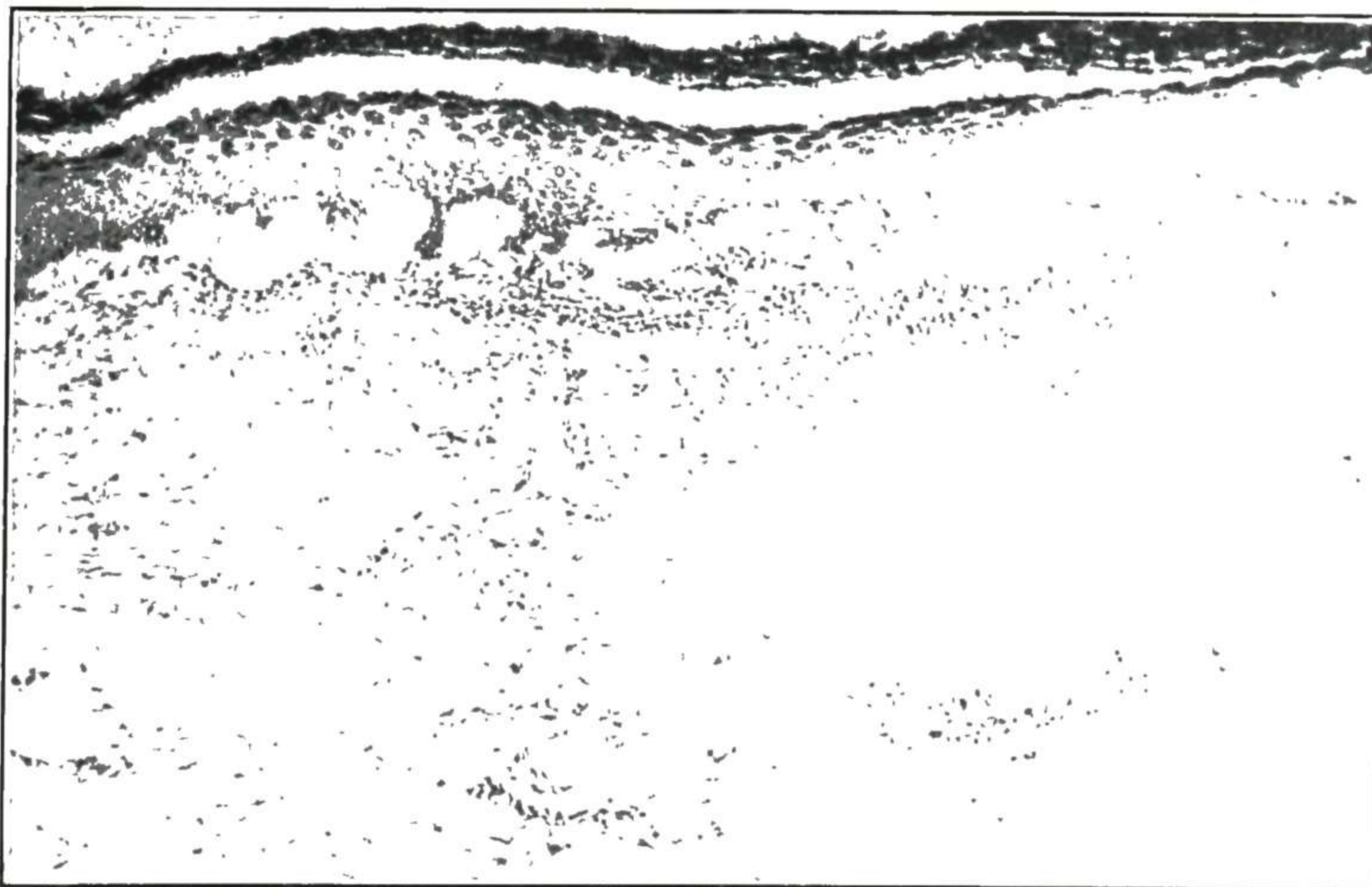


Fig. 271.—Leukoplakic vulvitis. A stage midway between the hyperplastic and atrophic condition. Low-power field, showing a zone of pigmented hyperkeratosis, eleidin layer still marked, epithelial layer sending short processes downward, and beginning development of collagenous areas in the connective tissue directly beneath the epithelium. (From Taussig: *Am. J. Obst. & Gynec.*)

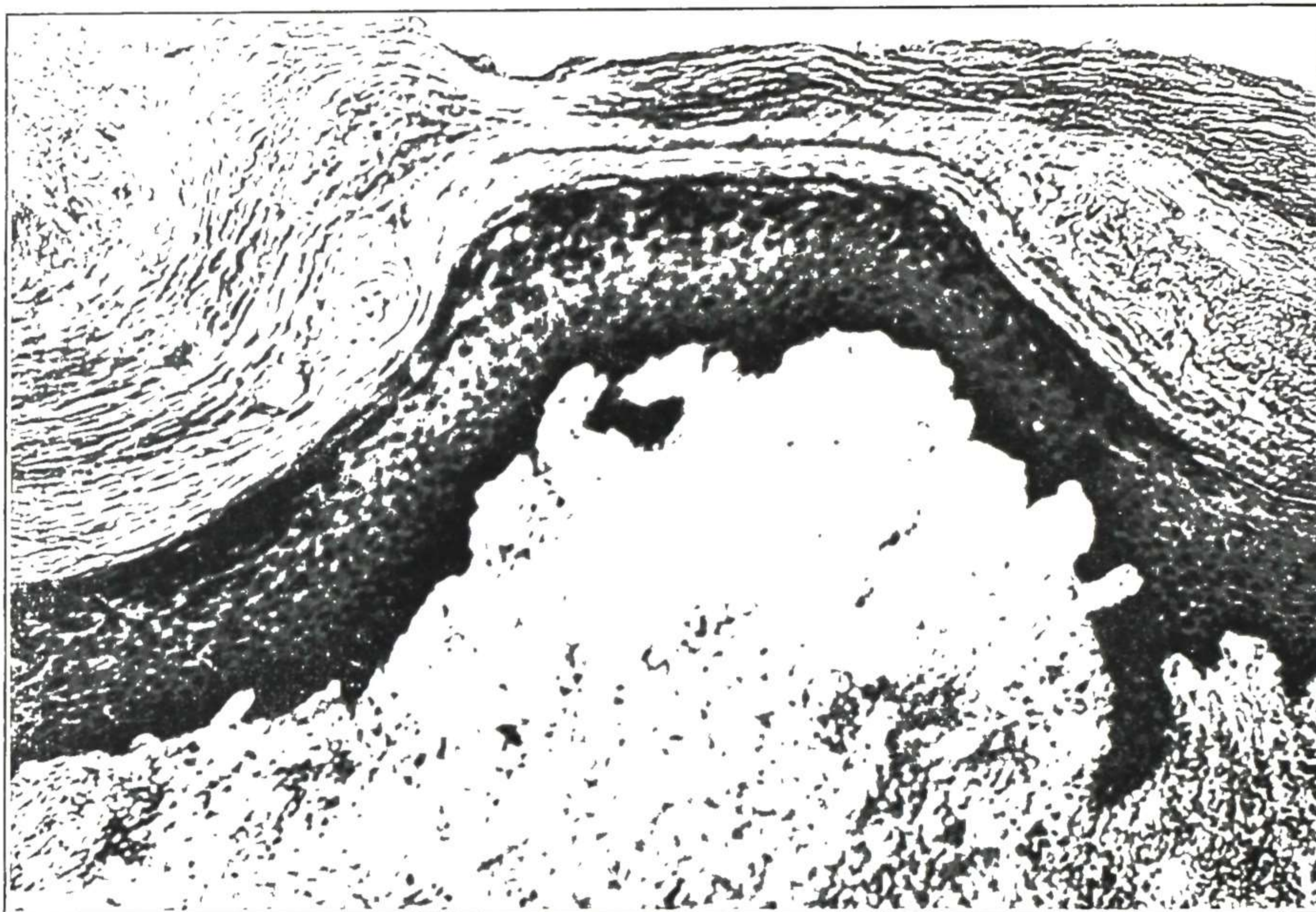


Fig. 272.—Leukoplakic vulvitis, showing a stage farther advanced than that in Fig. 270. Middle stage. Marked collagen formation in the connective tissue. Gyn. Lab.



Fig. 273.—High power of Fig. 272, showing, from above downward, the layer of hyperkeratosis, the black band caused by the increased number of eleidin cells, the short papillary projections of epithelium, and finally the collagenous connective tissue. Gyn. Lab.

sebaceous glands, and hair follicles) are slowly obliterated by pressure atrophy, leaving simply atrophic decolorized inelastic tissue covered with a thin layer of epithelium.

The tissue changes mentioned are usually accompanied with burning and itching and tenderness. Owing to the sensitive spots and narrowing of the vaginal orifice, coitus may be painful or impossible. As the tissues are brittle, care must be exercised in the examination to avoid causing additional fissures to add to the patient's discomfort. Leukoplakic vulvitis is one of the causes of severe and persistent pruritus vulvae, though not all of the patients are so disturbed.

The differential diagnosis presents little difficulty, as the appearance and palpable signs are characteristic. In ordinary leukoderma of this region, the affected skin is normal except for the absence of color, there are no troublesome symptoms, and there may be leukodermic spots elsewhere on the body.



Fig. 274.

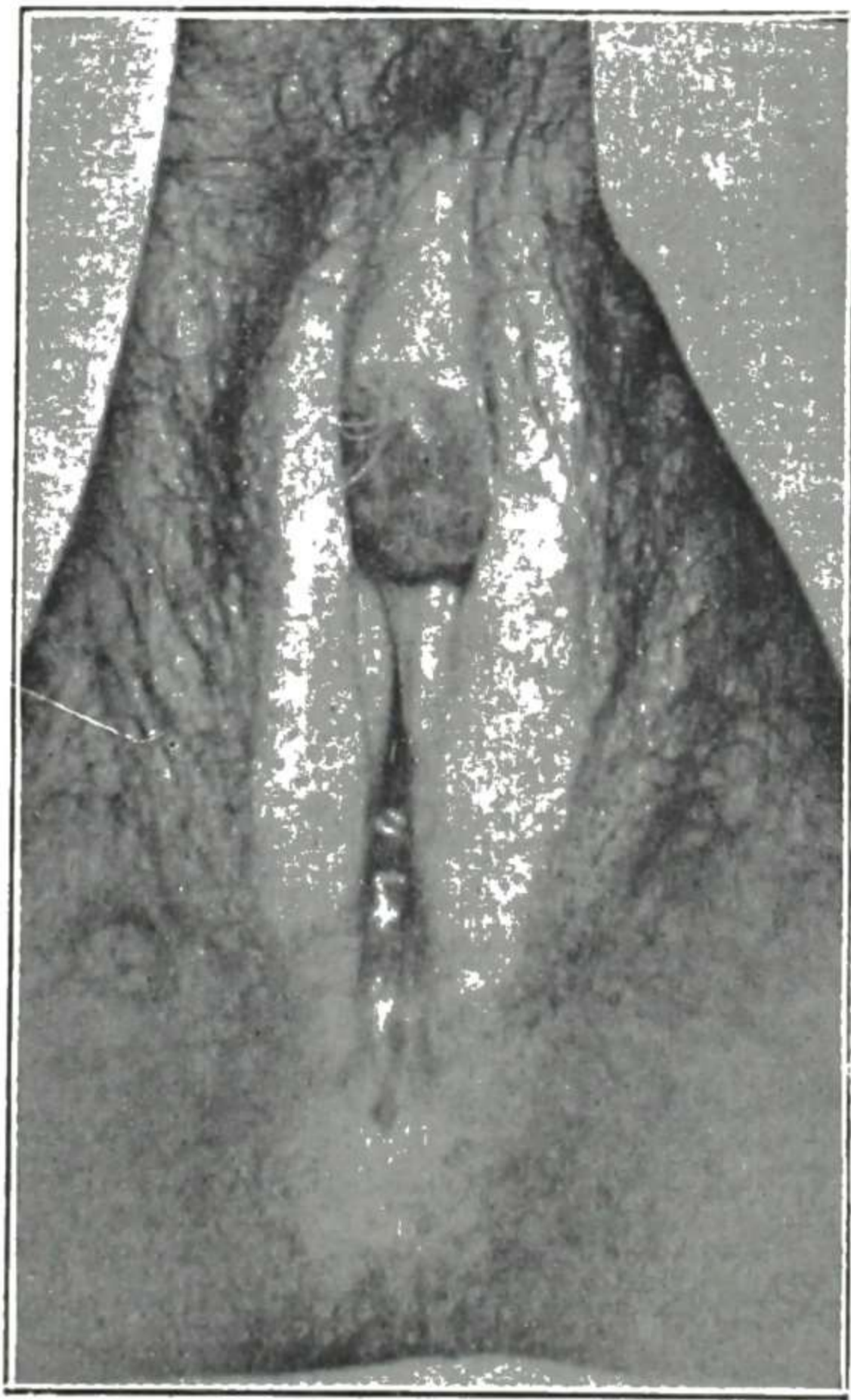


Fig. 275.



Fig. 276.

Fig. 274.—Leukoplakic vulvitis with kraurosis (early stage). The prepuce and perineum show leukoplakia. (From Taussig: *Am. J. Obst. & Gynec.*)

Fig. 275.—Carcinoma of the prepuce of the clitoris, an everting cauliflower nodule developing from the parchment-like leukoplakic vulvitis involving labia, prepuce, and perineum. (From Taussig: *Am. J. Obst. & Gynec.*)

Fig. 276.—Leukoplakic vulvitis with marked shrinkage. (From Hirst: *Diseases of Women*, W. B. Saunders Co.)

Treatment.—Conservative treatment of this condition was entirely unsatisfactory, until the introduction of vitamin A therapy by Hyams and Bloom. These workers reasoned that since keratization of the epithelium is one of the prominent features in leukoplakia and also in vitamin A deficiencies, vitamin A therapy should be effective. The daily dose varied from 250,000 to 500,000 units by mouth, supplemented by intramuscular injections of 50,000 units twice weekly. In addition, each patient received 15 minims of dilute hydro-

chloric acid in water three times daily. Of the eighteen patients treated, fourteen were relieved both subjectively and objectively. In a more recent report Hyams and Gallaher found that of 42 cases, 14 were relieved completely, 8 did not respond, 15 did not receive adequate treatment, and 5 had vulvotomies. They found an anacidity present in 35 per cent of these cases. If after a trial of several months there is no improvement, vulvectomy should be done because of the potential danger of carcinoma.

ULCERATIVE DISEASES OF VULVA AND VAGINA

The ulcerative diseases include simple ulcer, chancroid, syphilis, tuberculosis, granuloma inguinale, lymphogranuloma inguinale, and rarer ulcerations.

Simple Ulcer

A simple ulcer is an area of ulceration due to simple irritation or inflammation. A pessary or other foreign body may cause simple ulceration, if long in place without care, as may also infection at any point with ordinary pus germs.

The diagnosis of ulceration presents no difficulty, as it is established by finding an area devoid of epithelial covering presenting a granulating surface. An eroded area on the vulva or in the vagina, which is sensitive and bleeds easily, may be mistaken for an ulcer, but close inspection will show that the surface is still covered with a thin layer of epithelium. The diagnosis of simple ulcer is made by excluding the special types of ulceration, the characteristics of which will be found under each special disease.

As to treatment, removal of the cause and the use of a simple cleansing wash or douche will take care of a simple ulcer. Estrogenic vaginal cream such as Premarin speeds the healing of the ulcer, and it is especially helpful in older women where the ulceration is due to prolapse or pessary pressure. In such an ulcer carcinoma must of course be definitely excluded, and then if it does not clear promptly under local and oral estrogenic therapy it would be well to employ intramuscular administration of a potent preparation. Following radiation treatment for cancer, the estrogenic-deficiency type of ulcer may appear and require estrogenic treatment. It is possible that epithelization of chronic ulcers in other locations in the estrogen-deficient patient may be aided by estrogenic therapy.

Chancroid

Chancroid is an infectious ulcer, entirely local in its effects and due to inoculation with secretion from another chancroid. It is known also as "soft chancre" and as "soft sore." It constitutes one of the three so-called "venereal diseases" (gonorrhea, chancroid, syphilis).

It is due to a specific infectious agent which causes chancroid and nothing else. It is invariably due to contact with exudate from another chancroid, and sexual intercourse is nearly always responsible for this contact.

The infectious principle of chancroid is much more exclusively conveyed by sexual intercourse than is syphilis. Conversely, the chancroidal bacillus is much less liable than the *Treponema pallidum* to be conveyed in an active state

simply by contaminated articles. However, such method of conveyance is probably possible and must be guarded against. The chancroidal organism does not penetrate healthy epithelium but makes its entrance through a crack or abrasion.

The infectious agent is a short bacillus, discovered by Ducrey and hence designated as the **Ducrey bacillus**. It is a small nonmotile, nonspore-bearing, gram-negative bacillus. It is a short rod which may occur singly or in pairs or in groups of parallel rods. A new culture medium described by Dienst is the best for culture. The bacillus occurs in the discharge, but may be somewhat difficult to identify because of contaminating material.

In the case of enlarged glands, the purulent serum secured by puncture with a large hollow needle will usually show the bacillus.

Within twenty-four to forty-eight hours after infection, there appears a small pustule on an inflammatory base. This point of infection may be situated at any part of the external genitals or in the vagina. This beginning lesion may not be noticed by the patient, so that according to her statement the lesion may not have appeared for several days or a week after coitus. In a short time the epithelial covering over the infected spot is lost and a small ulcer is thus formed. This ulcer has sharp, punched-out margins, a rough and sometimes necrotic base, is surrounded by a red inflammatory zone, and is accompanied by more or less inflammatory edema. In cases of long standing or of much inflammation, there may be considerable round-cell infiltration and induration around the ulcer and under it, but there is rarely, if ever, the marked parchmentlike or cartilage-like induration that develops under the primary lesion of syphilis.

Diagnosis

A table of differential diagnostic laboratory tests suggested by Thomas is shown on page 251. The diagnosis of chancroid is based on the following points: (a) development within a few days or a week after suspicious coitus; (b) location and mode of development and appearance of the lesion; (c) two or more lesions, indicating autoinoculation; (d) absence of parchmentlike or cartilage-like induration under the ulcer; (e) presence of painful bubo, tending to suppuration; (f) in a doubtful case, bacteriologic examination is made to establish the presence of the Ducrey bacillus; (g) culture (Dienst media); (h) intradermal skin test (Ito-Reenstierna). Syphilis and lymphogranuloma inguinale are ruled out by means of the Kahn test and the Frei test.

Treatment

For chancroidal ulcer, cleansing and soothing treatment have supplanted the severe cauterizing applications formerly employed, which stirred up too much reaction. Washing with hot water and hot applications are employed, and if the ulceration is extensive, hot sitz baths. Between the hot applications, the ulcer may be kept covered with sulfathiazole powder.

The general treatment used by Satulsky in a group of 1,555 cases was sulfathiazole 1 Gm. four times a day for five days then 0.5 Gm. four times a day for ten days. All cases were treated in the army hospital and the average hospital stay was 11.2 days. There was an excellent response in all cases

treated. For the infected inguinal glands they advised against incision and in preference to this they inserted a small cannula, withdrew the pus, and then injected 1.5 c.c. of 7 per cent tincture of iodine and applied a tight dressing over the area. Pain and fever disappeared rapidly and the area completely healed in five to seven days. Since the advent of the antibiotics, streptomycin, one gram every six hours for five days, or aureomycin, one gram four times a day for five days, have been reported by several authors to give excellent results.

Syphilis

Syphilis is a general infectious disease, characterized by an initial sore (the point of entrance of the infecting germ) and by general secondary manifestations after several weeks and by tertiary lesions, localized in various parts of the body, usually only after several years.

The infectious agent is the *Treponema pallidum*, which is found in all lesions (primary, secondary, and only rarely in tertiary). The demonstration of this organism, by proper staining methods or by examination in the dark field, makes possible a positive diagnosis of syphilis at once, even in the primary stage and long before the positive clinical evidences appear.

The directions for preparing specimens are as follows:

In case of a suspected PRIMARY LESION (chancre), wipe the surface of the ulcer with cotton or gauze thoroughly; avoid causing bleeding. From the "irritation serum" which results, make a **spread-preparation** on a slide and then examine this fresh specimen by dark-field illumination for active spirochetes. Accurate identification is difficult and requires the service of an experienced worker in this field.

In SECONDARY LESIONS (mucous patches, moist papules, dry papules), a spread-preparation of the "irritation serum," made as above directed, will usually suffice for a diagnosis. The serological test is positive in 99 per cent of the secondary cases. A negative finding, however, does not certainly exclude syphilis. Consequently, to make the diagnosis certain, a **tissue specimen** may be examined. This is easily secured by clipping off a small papule. Preserve all tissue specimens to be examined for the *Treponema pallidum*, in 10 per cent formol solution. Specimens preserved in alcohol do not stain so well.

In TERTIARY LESIONS only **tissue specimens** can be used for bacteriologic diagnosis, though of course the Wassermann blood reaction is effective in all stages of the disease. For the details of the primary and secondary and tertiary manifestations of syphilis, see descriptions in general medical works.

Figs. 277 to 279 show syphilitic condylomas. Figs. 278 and 279, showing secondary lesion around the vulva and rectum, were from cases seen by Dr. Charles S. Stevenson. Positive dark fields were obtained in both cases. Fig. 280 shows syphilitic ulceration of the vulva, with stasis hypertrophy of the affected parts.

When the diagnosis remains doubtful, because of absence of general confirmatory signs or because of the possibility of a mixed lesion, excision of tissue for microscopic examination may be advisable. The microscopic tissue alterations are shown in Figs. 281 to 283.



Fig. 277.—Syphilitic infiltration and condylomas about the vulva. (From Hirst: Diseases of Women.)



Fig. 278.



Fig. 279.

Fig. 278.—Condyloma lata, late secondary lesions. Positive dark-field test obtained. (Courtesy Dr. Charles S. Stevenson.)

Fig. 279.—Secondary syphilitic papules. Positive dark-field test obtained. (Courtesy Dr. Charles S. Stevenson.)



Fig. 280.—Syphilitic ulceration of vulva with resulting stasis hypertrophy. Two views of the condition. (From Gallagher: *Surg., Gynec. & Obst.*)



Fig. 281.

Fig. 281.—Syphilis of vulva, microscopic section. Low power. Notice epithelial proliferation and areas of round cell infiltration. (From Gallagher: *Surg., Gynec. & Obst.*)



Fig. 282.

Fig. 282.—Syphilis of vulva. High power, showing giant cell.



Fig. 283.—Syphilis of vulva. Microscopic section, showing very marked epithelial prolongations into the underlying tissues. Gyn. Lab.

Treatment.—A patient should not be given treatment for syphilis until the diagnosis is positive. As a rule, a positive diagnosis before the appearance of the “secondaries” is not possible by the ordinary clinical evidences, not even by the Wassermann reaction, which at this time still may be negative. By dark-field examination, however, a positive diagnosis may be made at once, even in the very earliest stage of the primary lesion, when typical spirochetes are present. The accompanying table, proposed by Walter L. Thomas of Duke University, is very helpful in differential diagnosis of ulcerations of the vulva.

DIFFERENTIAL DIAGNOSTIC LABORATORY TESTS USED

| | |
|---|---|
| 1. Dark-field examination (<i>Treponema pallidum</i> and fusospirochetes) | 9. Smear type biopsy for granuloma inguinale (superior) |
| 2. Serologic tests for syphilis | 10. Smears for inclusion bodies (herpes progenitalis) |
| 3. Ducrey bacillary skin test (chancreoid infection) | 11. Rabbit inoculation, eye (herpes progenitalis) |
| 4. Direct smear, Gram's stain (<i>Hemophilus ducreyi</i>) | 12. Guinea pig inoculation (<i>Mycobacterium tuberculosis</i>) |
| 5. Culture for <i>Hemophilus ducreyi</i> | 13. Culture for <i>Mycobacterium tuberculosis</i> |
| 6. Biopsy for: (a) malignancy, (b) condyloma acuminatum, (c) tuberculosis, (d) mycotic infections, (e) tissue type, (f) granuloma inguinale | 14. Tuberculin tests |
| 7. Frei test | 15. Direct examination of material for fungi (<i>Actinomyces</i> , <i>Blastomyces</i> , <i>Candida</i>) |
| 8. Frei test biopsy | 16. Fungus and bacterial cultures |

It is not within the scope of this book to discuss the many problems in the treatment of syphilis. The most successful results are obtained with penicillin, and the usual treatment is 600,000 units of procaine penicillin G intramuscularly every day for ten days; for a current review of therapy, consult Anderson (see References). The treatment of the local lesion consists in cleansing with a mild antiseptic solution and care to prevent the spread of the infection.

The local treatment for the secondary and tertiary lesions of the vulva and vagina is simply cleansing with antiseptic and astringent, i.e., the same as for simple ulcers.

Tuberculosis of Vulva

Tuberculosis of the vulva is the term applied to those lesions of the external genitals produced by tubercle bacilli (Fig. 284). Tuberculosis of this region and other forms of persistent vulvar ulceration were formerly described together under the terms “lupus vulvae,” “lupus hypertrophicus,” “lupus perforans,” “ulcus rodens,” “destructive ulcer of vulva,” and “perforating ulcer of vulva.” As the pathology of the various forms of ulceration was gradually worked out, it was found that in many of the cases of destructive ulceration, tubercle bacilli were present. The tuberculous lesions were then formed into a class by themselves, and this class includes a large number of the cases of persistent ulceration formerly described under the titles above mentioned.

Tuberculosis of the vulva is due to local infection with the tubercle bacillus. The infection may take place through an abrasion, in which case the infecting germ may be brought to the abrasion by a tuberculous discharge from the uterus or vagina, or possibly by coitus with a husband having a tuberculous

lesion of the genitourinary tract or by fingers or clothing infected with tuberculous discharge either from the patient or from some other person.

On the other hand, tissues may, in rare cases, be infected without any break in the epithelial covering. In such a case the tubercle bacilli come by way of the blood or lymph.

Diagnosis.—Tuberculosis of the vulva begins as a small nodule, usually situated near the meatus or the clitoris or at the posterior commissure. After a time the nodules break down and form small ulcers. The ulcers have hard margins and an irregular base and are very liable to have an area of irregular infiltration about them.

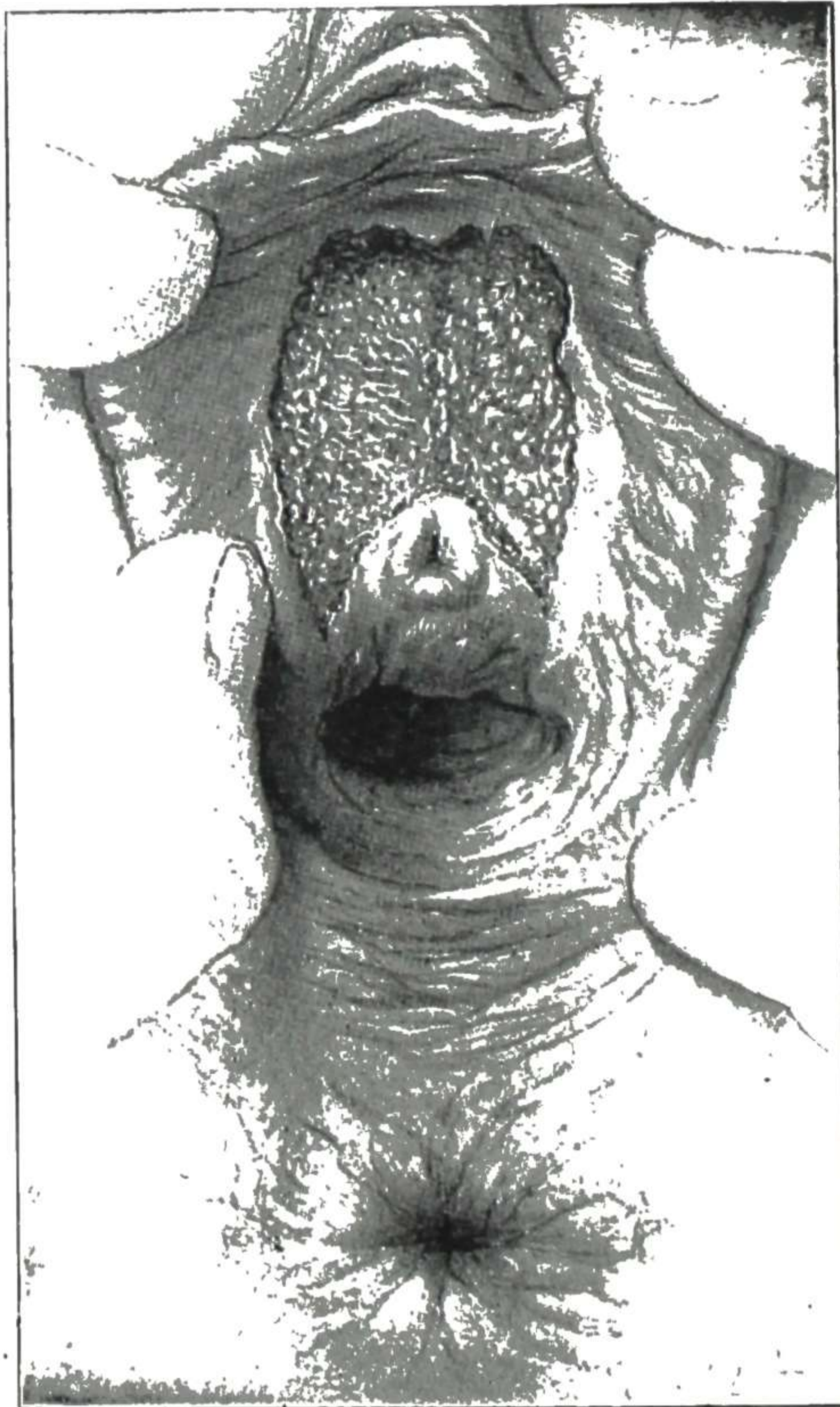


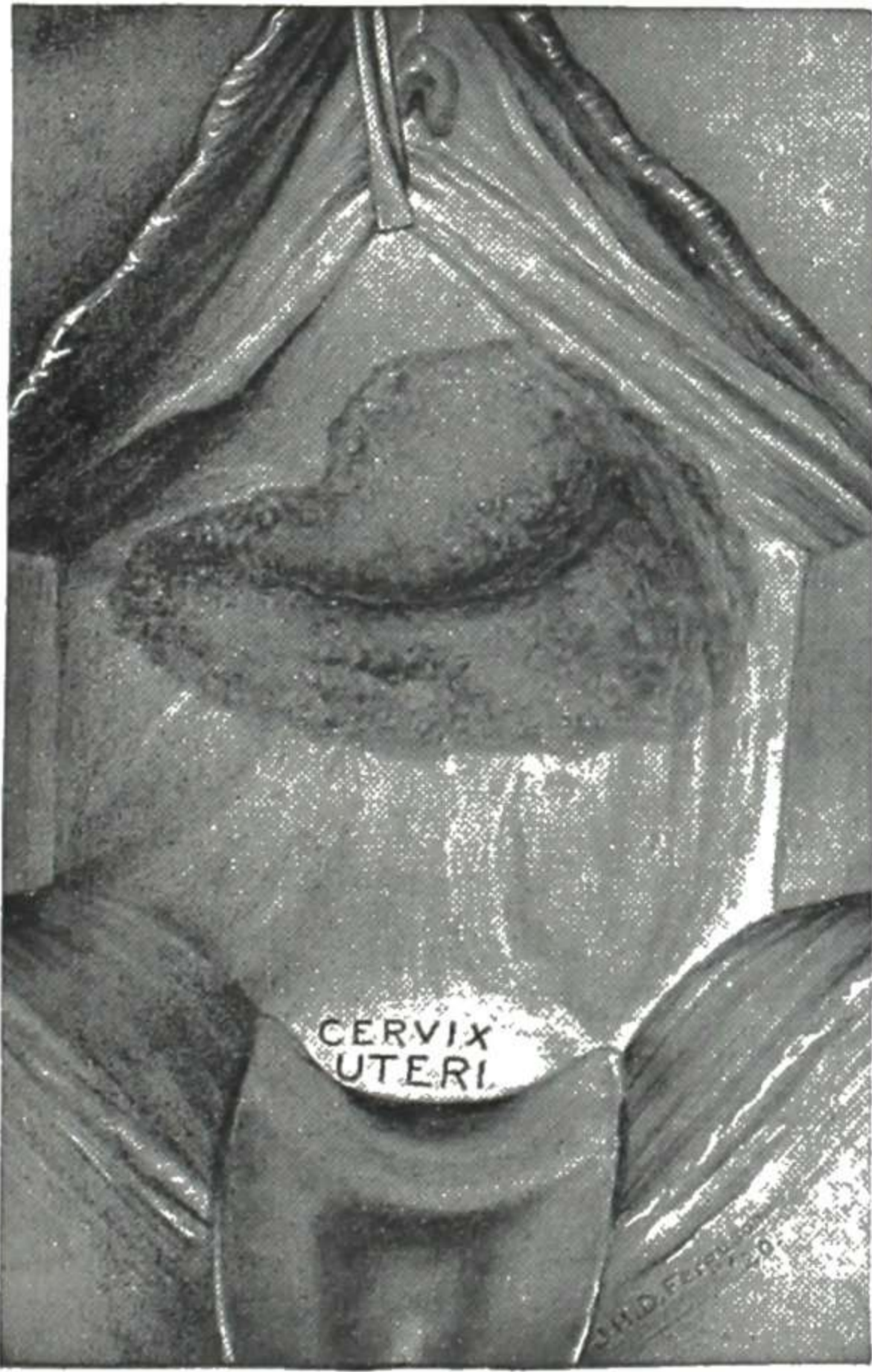
Fig. 284.—A tuberculous ulcer of the vulva. (From Kelly: *Operative Gynecology*.)

Tuberculous ulcers are chronic and persistent and may extend deeper and deeper until fistulous openings are formed into the rectum or bladder or urethra, hence the name "perforating ulcer." Even when adjacent cavities are not opened, the ulcers, in conjunction with the contracting scar tissue, may form sinuses and discharging surfaces extending deeply in various directions, and sometimes causing perforations through the labia.

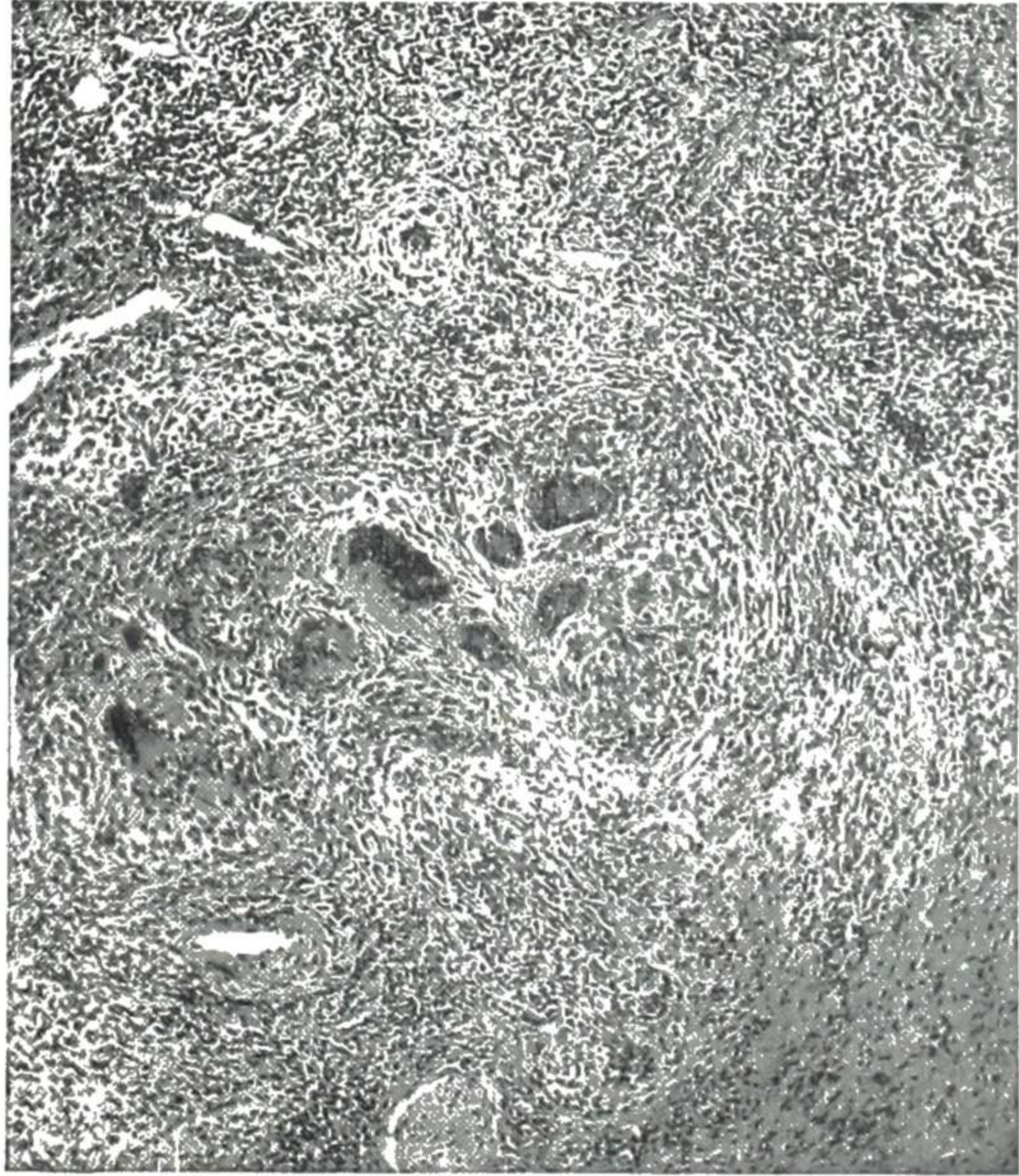
A positive diagnosis requires a microscopic examination. In a doubtful case the crucial test of the character of the ulceration consists in finding tubercle bacilli in the secretion or in demonstrating the characteristic pathologic changes in a specimen of tissue removed from the margin of the ulcer.

Tuberculosis of Vagina

Tuberculosis of the vagina (Fig. 285) is usually secondary to tuberculosis of the uterus and tubes, the vaginal surface being infected from the tuberculous discharge from above. Some cases occur, however, in which there is no tuberculous trouble higher in the genital tract. In such a case the vaginal tuberculosis may be due to sexual intercourse with a husband having a tuberculous lesion of the genital tract, or to the use of an infected douche nozzle or to the extension inward from tuberculosis of the vulva.



A.



B.

Fig. 285.—A, Tuberculosis of vagina. B, Microscopic section showing giant cells. (From Cullen: Surg., Gynec. & Obst.)

The lesion is very rare; Schmidt and Faulkner in 1947 reported a case and state that while the incidence of genital tuberculosis in the Western Reserve Hospitals is 2.41 per cent, the case reported was only the second one of vaginal tuberculosis that had been seen there in twenty-five years. This rarity of the lesion is probably due to the fact that the squamous type of epithelium is, like the skin, highly resistant to invasion. This is supported by Wharton's findings that twice as many cases occur before ten years of age as in any other decade of life; at this age the epithelium is immature and susceptible to invasion.

The most common site for vaginal tuberculosis is the posterior vaginal fornix, which region comes most in contact with the uterine discharges. It is supposed that the resistance of the vaginal epithelium must be lowered by an irritating discharge, or otherwise, before invasion by the tubercle bacillus can take place. The first manifestation of tuberculosis of the vaginal wall is the development of a number of miliary tubercles. These may be confined

to a small area, for example, to the posterior fornix, or may appear over a large part of the surface at once.

Each miliary tubercle is a small, raised, grayish or yellowish dot, the size of a millet seed or smaller. As the lesions develop they break down and form small ulcers, which may coalesce and form ulcers of various sizes. The tuberculous ulcer has a punched-out appearance, the edges being perpendicular, and the base is yellowish gray and may show many miliary tubercles. The miliary tubercles frequently occur in large numbers in the hyperemic zone about the ulcer.

Symptoms and Diagnosis.—The stage of ulceration is usually the time at which the patient consults the physician, complaining of discharge and discomfort. Examination reveals the suspicious ulcer or ulcers and further investigation will usually show tuberculous disease of the uterus or tubes.

The discharge from a tuberculous ulcer contains tubercle bacilli, but sometimes in such small numbers that they are not found when the discharge is stained and examined. In a doubtful case, some tissue from the margin of the suspected ulcer may be submitted to microscopic examination. In such a specimen, in addition to the tubercle bacilli, there are found the characteristic giant cells and necrotic areas. Another way of testing for tuberculosis in the laboratory is by injecting some of the secretion into the peritoneal cavity of a guinea pig, where in time it causes tuberculous peritonitis with characteristic lesions.

Treatment.—Since the lesion is almost invariably secondary to infection elsewhere, a careful search should be made for the primary infection. General therapy consists of dihydrostreptomycin 1.8 Gm. intramuscularly daily for three to four months. If the local lesion is so situated that it can be easily excised, this should be done. If there is general pelvic tuberculosis, a complete hysterectomy and bilateral salpingo-oophorectomy is indicated. In very young women an ovary can sometimes be saved, and operation should be postponed until there is a thorough trial of antibiotic therapy. For surface lesions actinic light therapy has been used successfully in Norway, Sweden, and Denmark.

Granuloma Inguinale

(Due to the Donovan Bacillus)

This tropical form of ulceration about the genitals (Figs. 286 and 287) has been found to occur not infrequently in temperate zones. Following the early report of Symmers of two cases in Bellevue Hospital, New York, Randall, Small, and Belk reported sixteen cases from the Philadelphia General Hospital.

Most of our recent knowledge on this and related granulomas has come from reports by Greenblatt and his associates at the University of Georgia as well as from Thomas at Duke University and Sondag in Florida. The disease is endemic in the south, affecting principally the Negro race.

The usual history is that the lesion started as a small papule, noninflammatory, which, after rupture and the exudation of a slightly purulent fluid, refused to heal and exhibited progressive tendencies toward slow proliferation and spreading. The typical lesion (especially seen when involving the inguinal region, see Figs. 286, 288, and 290) is a flesh-red, exuberant overgrowth of soft granulation tissue.

As indicated by the name, the most frequent location is in the groin, spreading upward as far as the anterior superior spine and downward through the fold of the groin, frequently involving the perineum, and in some cases following the fold of the nates and spreading to the buttocks. In certain patients the history apparently points to granuloma infection superimposed upon a prior existent genital lesion.

It is now known that this organism can cause lesions elsewhere in the genital system and more distant parts of the body. Numerous cases have been reported involving the vagina and the cervix. Pund reported four cases in which the uterus was involved, and a fifth case was reported by Polayes and Wikle. A case with extensive involvement of the vagina and cervix with bone metastases was reported by Packer and his associates; recently Lipp and Bibby added another case showing bone involvement.

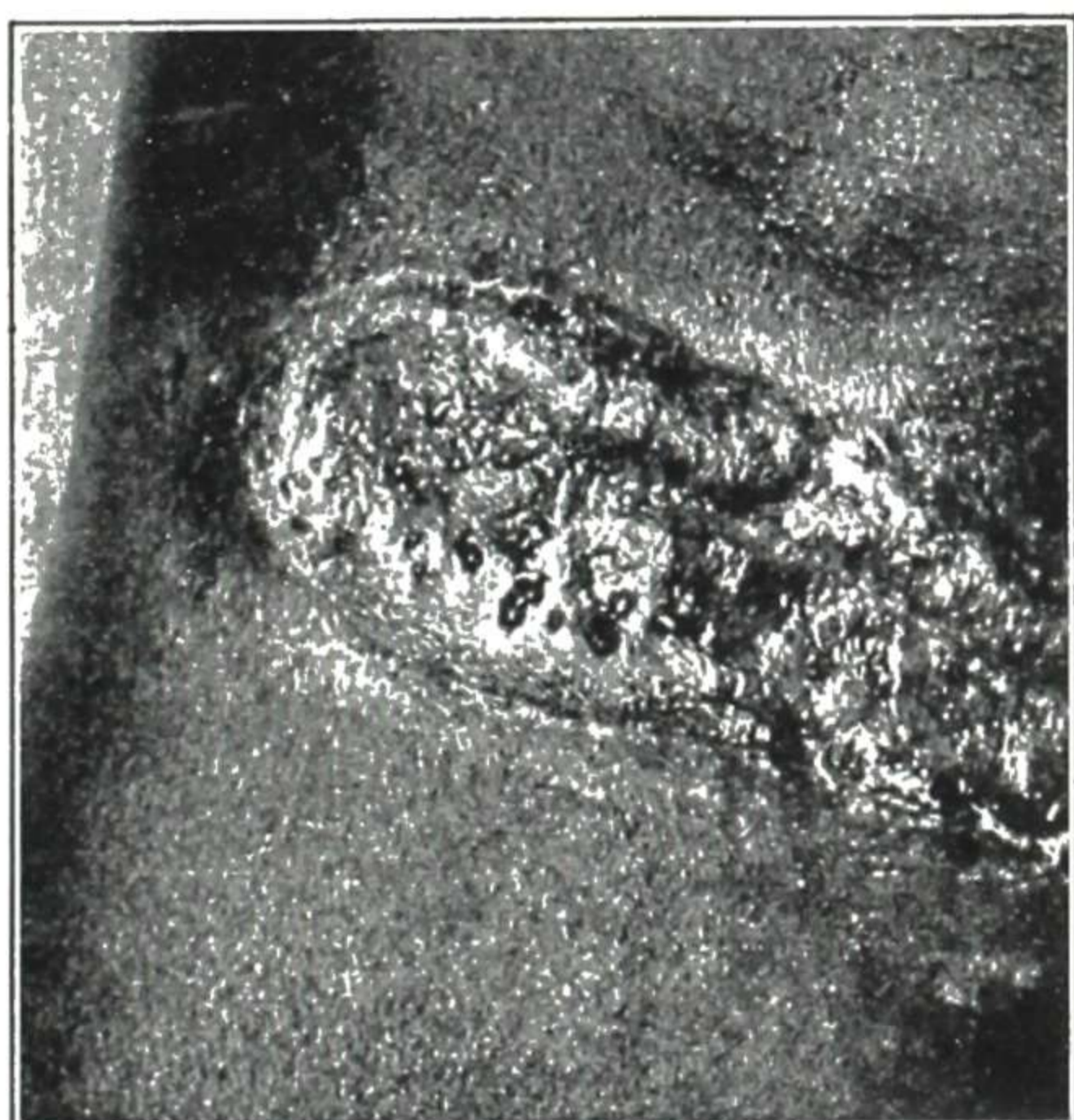


Fig. 286.

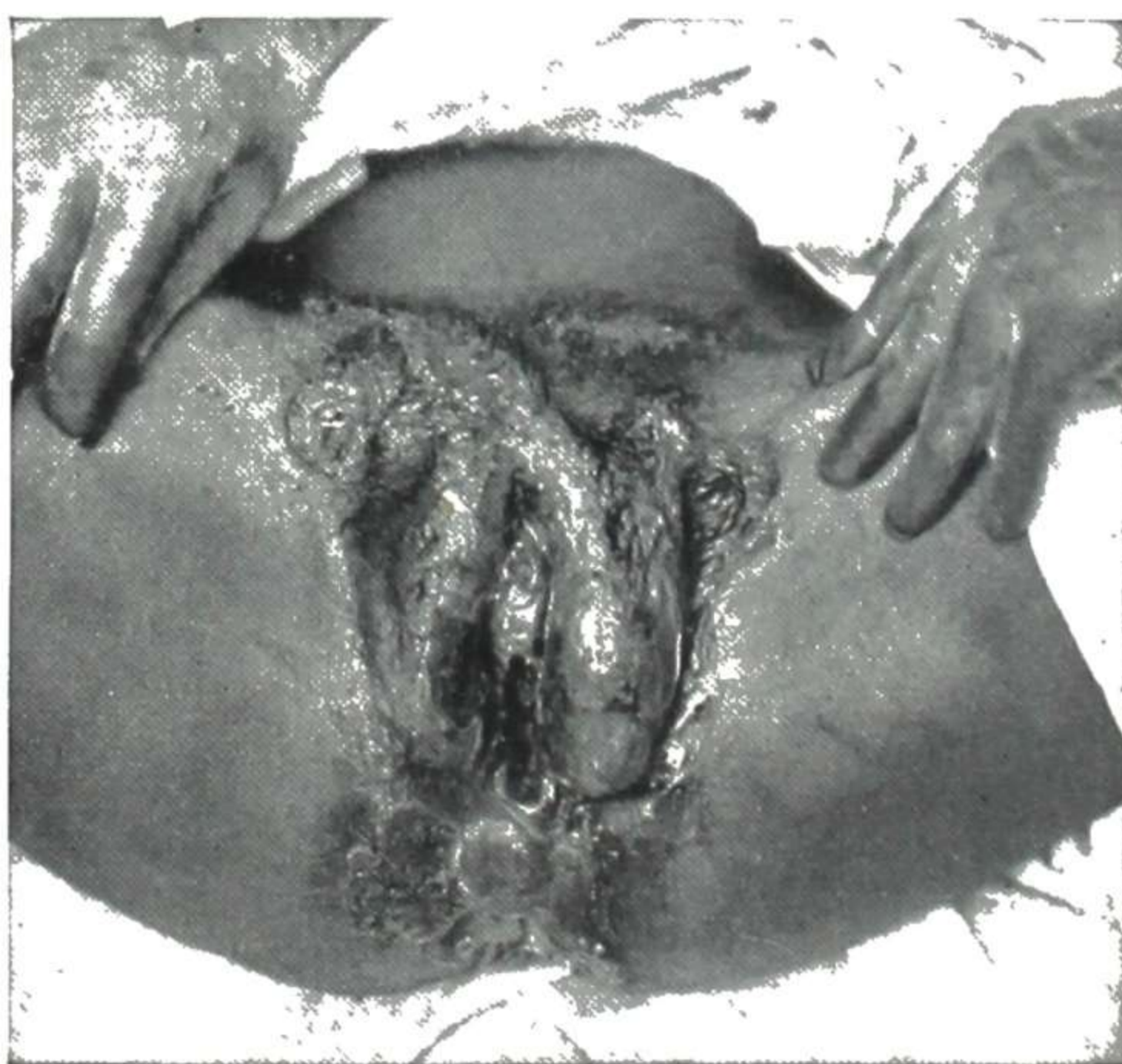


Fig. 287.

Fig. 286.—Granuloma inguinale, showing the inguinal ulceration. (From Symmers and Frost: J. A. M. A.)

Fig. 287.—Granuloma inguinale, showing extensive vulvar ulceration. (From Randall, Small, and Belk: Surg., Gynec. & Obst.)

Diagnosis.—A positive diagnosis is made by finding the typical Donovan bodies in the smear or in the tissue. Smears were formerly obtained by scraping the exuding surface of the lesion, but more recently the smears are made from bits of tissue removed from the central portion of the lesion by means of a biopsy forceps. The tissue is rubbed between two glass slides, then dried, and stained with either Wright's stain or Wilson's modification. The technique is the same as that used for a blood smear except that the stain is allowed to remain a little longer before dilution with distilled water. The accuracy of the tissue smear compared with the identification of the Donovan bodies in routine sections stained with the Delafield's hematoxylin eosin varies in different reported series (Figs. 288 and 289). Pund and Greenblatt found the tissue sections satisfactory, while Thomas favors the tissue smear.

Treatment.—Until the introduction of the antibiotics, materials containing antimony such as tartar emetic and Fuadin were the drugs of choice in

treating this disease, but it has now been shown that streptomycin, aureomycin, and Chloromycetin (chloramphenicol) are the most effective agents in granuloma inguinale. The following dosage schedules are given by Greenblatt: Streptomycin 1 gram every six hours for five days for a total of 20 grams. In extensive lesions 40 to 60 grams may be necessary, but even with these there is about a 10 per cent recurrence. Hoge reported cures in 8 cases



Fig. 288.



Fig. 289.

Fig. 288.—Donovan bodies from lesion shown in Fig. 290. (From Greenblatt et al.: *Am. J. Obst. & Gynec.*, May, 1950.)

Fig. 289.—Isolated Donovan bodies showing polar staining. (From Randall, Small, and Belk: *Surg., Gynec. & Obst.*)

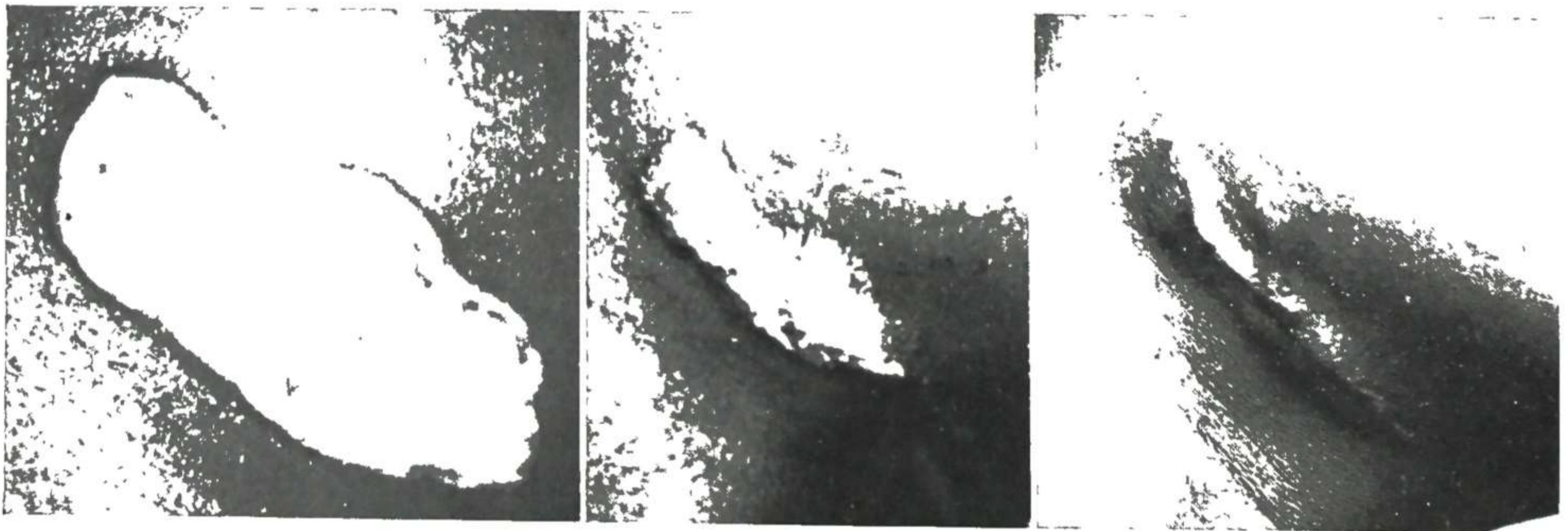


Fig. 290.—Case of granuloma inguinale reported by Greenblatt and associates. *A*, Before treatment with Chloromycetin. *B*, After first course of 20 Gm. Chloromycetin over a period of ten days, showing 80 per cent improvement in lesion. *C*, After a second similar course of therapy, healing completed. (From Greenblatt et al.: *Am. J. Obst. & Gynec.*, May, 1950.)

with streptomycin, 3 ceryical and 5 vulvar. Aureomycin is more effective than streptomycin and it is used in cases of recurrence. The dosage is 500 mg. every six hours for ten to fourteen days. The disadvantage of aureomycin therapy is the associated nausea and, not infrequently, diarrhea. Chloromycetin in the same dosage as aureomycin is almost as effective and there are few adverse reactions (Fig. 290).

In over half of the cases of granuloma inguinale or lymphogranuloma inguinale there is associated another venereal disease such as syphilis or gonorrhoea; consequently one must keep this in mind in the diagnosis and treatment.

In lesions which do not respond completely or where there is marked chronic edema of the vulva, vulvectomy may be indicated.

Lymphogranuloma Inguinale

(Due to a Filtrable Virus)

The use of the term "lymphogranuloma inguinale" for a disease occurring in the same location as granuloma inguinale and somewhat resembling it clinically, but entirely different etiologically, is confusing and unfortunate, but seems established for want of a better term. The two are entirely distinct diseases, granuloma inguinale being an ulceration of the skin due to the Donovan bodies (encapsulated bacilli), while lymphogranuloma inguinale is a disease of the lymph channels and nodes due to a filtrable virus. The virus has been identified from smears of exudate from the acute lesion and has been designated "elementary bodies." The virus can be cultured in egg yolk and its life cycle is known. Hellendall has shown that it can be transmitted experimentally through the placenta in mice and he suggests that a clinical study of offspring of mothers in the latent and the acute stage of the disease would be very valuable in determining whether or not congenital transmission is possible in the human being.

Lymphogranuloma inguinale in this country is seen most frequently in the Negro. While in the male it usually appears as an inguinal lymphadenitis (hence the term "climatic bubo"), in the female it is more frequently seen as rectal ulceration. This location of the ulceration in the female is due to the perirectal distribution of the lymph nodes draining the perineum and posterior vaginal wall, which are the usual points of entrance of the virus.

There seems to be no special disturbance at the point of entrance. The lymphatic inflammation comes later, accompanied at times with fever and abdominal pain and occasionally multiple arthritis. Still there is ulceration of the rectum which may be accompanied by extension of ulceration out onto the external genitals, as shown in Figs. 291 and 292. Marked involvement of the inguinal glands is rare in the female, but common in the male owing to the lymphatic distribution from the usual points of infection. Figs. 293 and 294 give the characteristics of the inguinal lymphadenitis. The ulceration in the rectum is likely to result later in stricture.

Pathogenesis.—The primary lesion is very insignificant and is usually overlooked. This appears in ten days to three weeks following exposure. The primary lesion may be a simple papule or multiple papules. The most frequent secondary manifestation is the inguinal bubo. This occurs more often in men but may occur in women, when the lesion is about the external genitalia. The chief characteristic of the bubo is its chronicity. It is generally unilateral and in time breaks down into multiple fistulae. The skin overlying the inguinal bubo becomes attached to the underlying inflamed glands and is of a bluish-red cast. A single gland may be involved or a conglomerate mass of glands involving the inguinal and femoral regions.

The second most frequent lesion is stricture of the rectum. This usually occurs in women and particularly in Negroes, although there is no doubt that this lesion as well

as all other manifestations of the disease are appearing more frequently in the white race. Where rectal stricture occurs, it is assumed that the primary lesion is within the vagina or about the cervical outlet. The third manifestation of the disease occurring in women is esthiomene or the deforming lesion about the external vagina resulting in massive fibrous infiltration which may tend to contract the vaginal outlet.



Fig. 291.



Fig. 292.

Fig. 291.—Extensive fistulous esthiomene of long duration, showing perianal fistulous opening. The Frei reaction was positive.

Fig. 292.—Chronic perianal nodules and scar formation accompanying a high grade stricture of the rectum. The Frei reaction was positive, the Wassermann reaction negative.

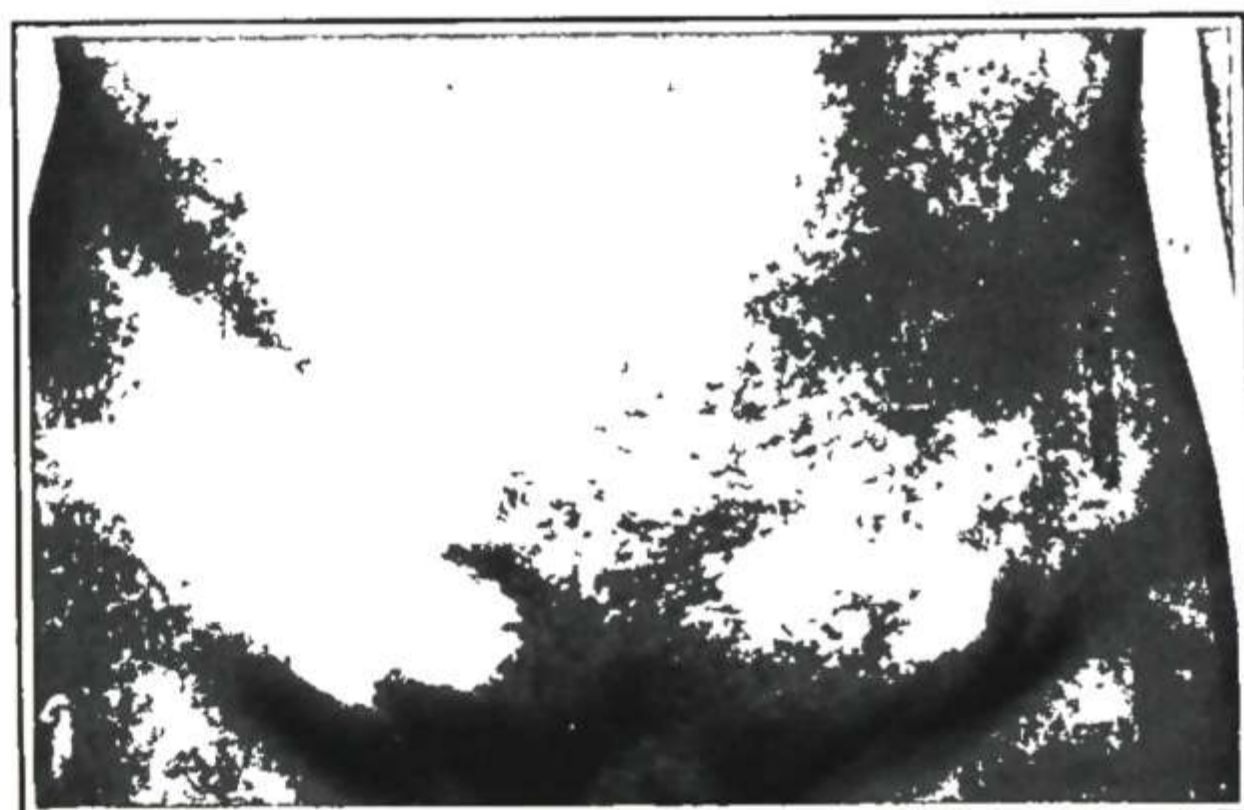


Fig. 293.



Fig. 294.

Fig. 293.—Characteristic bilateral lymphogranuloma inguinale. Three Frei reactions on the right forearm still positive after ten days.

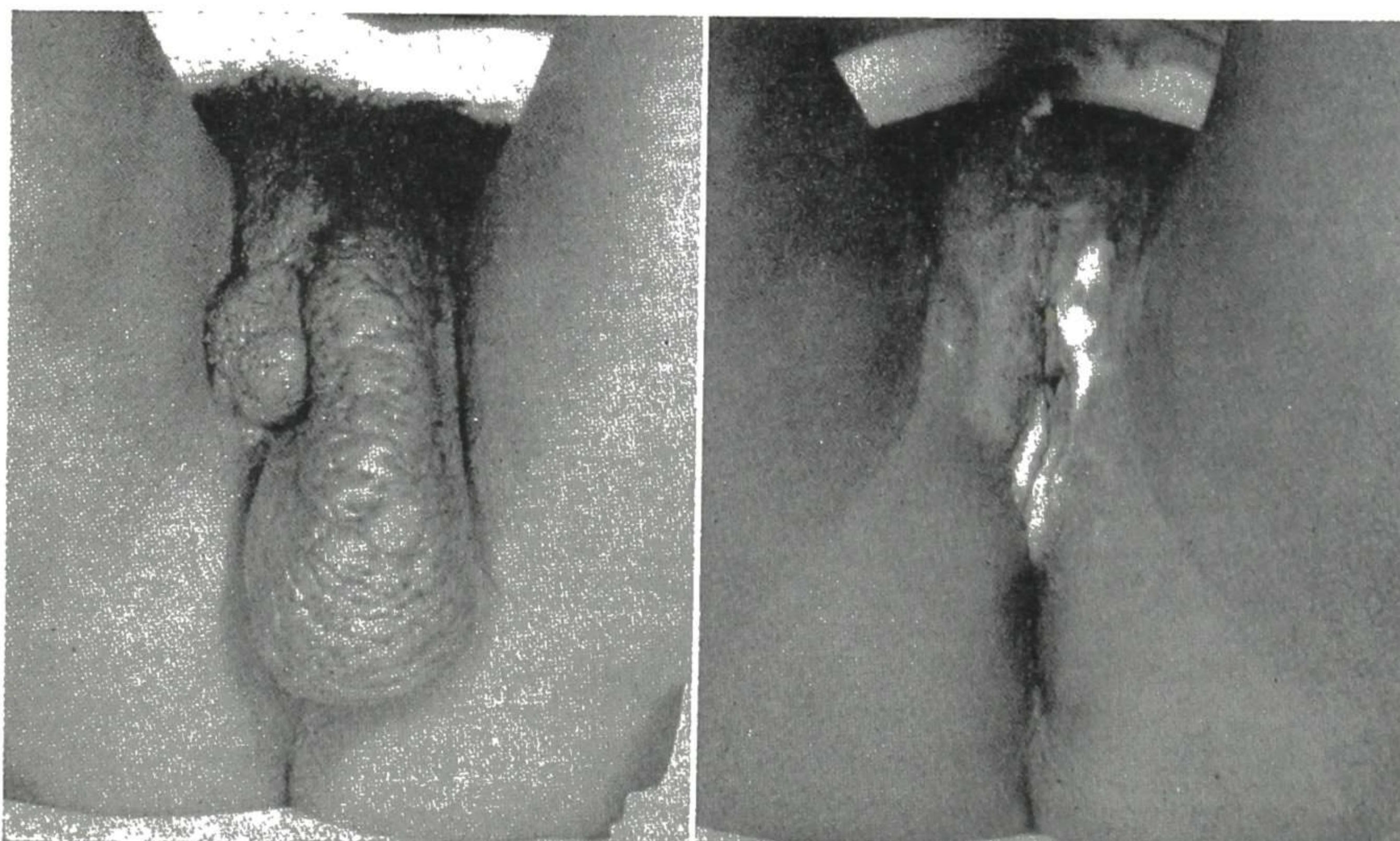
Fig. 294.—Bilateral lymphogranuloma inguinale, showing a multiple fistulous opening.

(Figs. 291 to 294 from H. N. Cole: *J. A. M. A.*)

The fourth manifestation of the disease occurring in men may result in chronic or even permanent elephantiasis of the penis and scrotum. In rare instances partial destruction of the penis has been known. In atypical types the lesion has occurred upon the finger with secondary glandular manifestations at the elbow and in the axilla. The primary lesion has been known to come in the mouth with glandular involvement in the floor of the mouth and the glands of the neck. Recently, lesions occurring in portions of the

large intestine have been recognized as manifestations of lymphogranuloma. Certain eye changes and involvements of the meninges have been observed in the acute stages and in exacerbation of the disease. Other symptoms are: general temperature accompanied by abdominal soreness; and multiple arthritis with painfully swollen joints.

Diagnosis.—The diagnosis is made by use of the Frei test. One-tenth cubic centimeter of the antigen is injected intradermally into the arm of the patient. The reaction reaches a maximum in forty-eight to seventy-two hours after the injection, at which time the reading is taken. A positive test is characterized by the appearance of a hard red papule around which there is an erythematous ring. A control antigen is used for comparison. The Frei antigen was formerly made from the pus from an active bubo; later, infected mice were used, and more recently the antigen has been made on chick embryos. As usually done this test is not specific, as, because of the close relationship between the viruses of the psittacosis and the lymphogranuloma



A.

B.

Fig. 295.—A, Biopsy of ulcerated edges reported as granuloma venereum, Frei test positive. Photograph taken after streptomycin therapy. B, Postoperative photograph. Incision healed by primary intention. Tissues are soft and pliable. (From Hester: *Am. J. Obst. & Gynec.*, August, 1951.)

groups, a positive Frei test may occur with either disease. Bedson and his co-workers found that acid extracts of these viruses when injected intradermally react specifically for the virus with which the person is infected. The Frei test by itself merely indicates that there has been an infection with the virus and it does not give any indication as to whether the infection is active. The other very important test which should always be done is the complement fixation test. Using the Bedson modification with steamed lymphogranuloma virus and the sera of patients in whom the clinical findings are compatible with lymphogranuloma, titers of 1 in 32 or over are indicative of active infection with this virus. A third finding in these cases is a reversal of the serum albumin-globulin ratio.

The criteria of cure for cases of lymphogranuloma inguinale are a normal serum albumin-globulin ratio, and a complement fixation titer lower than 1 to 32; the Frei test may remain positive but this does not denote activity. As long as there are open lesions the condition is infectious.

Treatment.—The treatment consists of chemotherapy, vaccines, antibiotics, and/or surgery. The drug which has given fair results, especially in the acute stage, is sulfadiazine. This is given in large doses of 15 Gm. daily for two days, then 1 to 2 Gm. daily for two to four weeks. For vaccine therapy a vaccine is prepared from the pus of a bubo, as for the Frei antigen. A dose of 0.1 to 0.2 c.c. is given once or twice a week over a period of months. Of the antibiotics aureomycin and Chloromycetin give the most promising results. Greenblatt recommends a dosage of 0.5 Gm. four times a day for three to four weeks or longer if needed to clear up the inflammation or discharge. Rowe obtained some excellent results using Chloromycetin, and he states that this agent shows promise in effecting a cure in the acute cases and palliation in the moderately advanced cases. Estrogen therapy was found by Seley and his associates to be effective in softening rectal strictures. A dose of 3 to 5 mg. of estrone sulfate or stilbestrol or more was given daily for seventeen to thirty days. Four candidates for colostomy were relieved, making the operation unnecessary, and the relief persisted for seven months in two of the cases after the estrogen therapy was discontinued. The operative procedures done depend upon the lesions present; with rectal obstruction colostomy is indicated. In the female there is usually some elephantiasis which does not respond to therapy, and vulvectomy is done to remove the large labia. There is increasing evidence that the association of rectal and vulvar carcinoma with this disease is not rare; hence this combination should always be kept in mind. Excision following streptomycin is recommended by Hester (Fig. 295).

Rarer Ulcerations

Though these conditions are infrequent, they may be encountered and hence are mentioned to call attention to them.

Actinomycosis.—Actinomycosis of this region occurs usually as an indurated area in the groin, which may ulcerate with the ulcerating surfaces presenting yellow granules. The disease is easily identified microscopically.

The treatment is the administration of 300,000 to 400,000 units of penicillin daily for one to three months if necessary. With the penicillin, sulfadiazine 1 Gm. three times a day for several weeks is helpful in resistant cases. Filtered roentgen therapy at times helps to stimulate the healing in indolent ulcerations. A search for other foci of infection should always be made.

Tularemic Bubo.—Pasternack reported two cases of this condition and mentioned that there are six cases in the literature. The disease is caused by the bite of wood ticks, dog ticks, and certain other species of ticks which are hosts of the *Bacterium tularensis*. The symptoms are those of an undulant fever plus enlarged tender inguinal glands. Certain ticks are important agents in the transmission of tularemia. Ticks bite in the hairy regions, the perineum and genitalia being favorite sites; this results in inguinal lymphadenitis.

The treatment is with streptomycin, aureomycin, or Chloromycetin. The latter gives fewer side reactions; the dose is 500 mg. daily until the temperature has been normal for seventy-two hours.

Foreign-Body Granuloma.—In the differential diagnosis of chronic ulcerations it must be kept in mind that powder grains of various kinds may become embedded in tissues and give rise to foreign-body granulomas which may be persistent and troublesome. Antopol and Robbins report instances of lycopodium powder causing puzzling granulomas of the peritoneum from use on operating gloves, and of the rectum from use on suppositories. They show lycopodium spores in sections of granulation tissue. McCormick and Ramsey give an extensive review of this subject.

Ulcus Acutum Vulvae.—This is an acute ulcer of the vulva occurring usually in girls or young women in whom there has been no exposure to venereal diseases. Though the clinical entity was recognized as early as 1903, its etiology remained obscure until 1923 when Lipschütz found that the *Bacillus crassus* was always present in large numbers. He reasoned that lowered tissue resistance rendered this normally saprophytic organism pathogenic. Two types of lesions occur: the gangrenous and the veneroid. The lesions in the former are multiple and are localized on the contiguous aspects of the labia minora. The edges of the ulcers are soft and steep and the lesion is covered by a grayish-black membrane. There is usually a sudden onset accompanied by a high fever. In the second type the general reaction is mild and the ulcers are shallow with serrated edges. These are tender, and new ones appear as the older ones heal. They are sometimes confused with chancre. Treatment consists of methylene blue locally, and rest.

NONMALIGNANT GROWTHS AND SWELLINGS OF VULVA

These include condylomas, stasis hypertrophy, tumors, hernia, hydrocele, varicose veins, and hematoma.

Condylomas

Condylomas are small nonmalignant growths occurring about the vulva. There are three varieties: the common wart (*verruca vulgaris*), the pointed condyloma (*condyloma acuminatum*), and the flat condyloma (*condyloma latum*). The common wart occurs frequently about the vulva. It is usually situated on the labia majora or mons veneris. The particular cause for it is not known. It is dry and sometimes much pigmented but rarely causes any disturbance. Moles also may occur here as on other skin surfaces.

The POINTED CONDYLOMA or moist wart occurs on those parts of the vulva which are frequently moist, namely, the vestibule, the vaginal entrance, the labia minora, the perineum, and about the anus. In some cases they occur on the labia majora and even on the thighs. (Figs. 296 and 297.)

They are usually associated with venereal disease but not necessarily so. They are small, pointed, papillary masses with a thick covering of epithelium (Figs. 298 and 299). They occur singly or in groups or in large numbers. They may vary in size from that of a pinhead to that of a large cauliflower mass, covering half or more of the vulva.



Fig. 296.



Fig. 297.

Fig. 296.—Scattered condylomata of the vulva. (From Hirst: *Diseases of Women.*)

Fig. 297.—Small masses of condylomata. (From Gilliam: *Practical Gynecology*, F. A. Davis Co.)



Fig. 298.



Fig. 299.

Fig. 298.—Pointed condyloma of vulva. Longitudinal section, low power. Gyn. Lab.

Fig. 299.—Pointed condyloma of vulva. Longitudinal section, showing the marked thickening of the surface epithelium, and the distribution of the epithelium in the secondary projections. Gyn. Lab.

They are due to some irritating discharge, usually gonorrhoeal. Sometimes they are due to a simple discharge as, for example, the increased vaginal discharge of pregnancy. When present during pregnancy they grow very rapidly. Whenever they are found, a careful search should be made for evidences of previous gonorrhoea or other cause of persistent vaginal discharge.

The FLAT CONDYLOMAS (Fig. 277) constitute the characteristic vulvar lesions of secondary syphilis. If the overlying epithelial layers are thrown off, the flat condyloma becomes a superficial ulcer, as mentioned under Syphilis.

Treatment.—Until recently the treatment for condylomata acuminata consisted in keeping the vulva clean and applying mild antiseptic or caustic ointments and douches to clear up any vaginal discharge. If this was not successful, coagulation with electrosurgery or x-ray or radium was used. In 1944 Culp and Kaplan reported 200 cases treated with podophyllin, and since this report numerous others have been published. The cytological effects of podophyllin were studied by Sullivan and Weschler. Following its application the condylomata become edematous and an inflammatory reaction appears and remains for several days. Within a week involution occurs and the wart shrinks into a small mass and finally drops off, leaving no scar. Various vehicles for the podophyllin have been suggested: Sullivan and King use 25 per cent in mineral oil, Marks used a 15 per cent solution in compound tincture of benzoin, Weiss uses a 25 per cent solution in 90 per cent alcohol, and there is also an ointment, 25 per cent in a hydrosorb base (Abbott). Whichever preparation is used, care must be taken to protect the surrounding normal skin with petrolatum before applying the solution to the wart. Six to eight hours later the area including the warts is washed thoroughly with soap and water. The patient returns in ten days and if necessary a second application is made. The active principle of podophyllin is podophyllotoxin.

In extensive cases or in those which do not respond promptly to this therapy, the area should be scrubbed with formalin under anesthesia or excised. In a case of ours it was necessary to excise a large part of the vulva; in spite of this, additional warts began to appear, and the patient was given a preparation of bismuth sodium triglycollamate (Bistrimate) orally, two tablets three times daily for a month, and this stopped recurrences. O'Connor and Tweedall also report good results with this drug.

The flat condylomas require the regular constitutional treatment for syphilis. Locally cleanliness should be secured by frequent washing with some mild antiseptic, and if there is much vaginal discharge, douches should be taken. After the washing, the parts are to be carefully dried and then dusted freely with some drying powder, such as calomel.

Stasis Hypertrophy

Occasionally in pregnancy a massive edema of the vulva will occur. Arnell and associates attribute this to dietary deficiencies, chiefly in protein intake. They advocate the following treatment:

1. Complete bed rest was instituted at once, with, as already noted, general improvement within a few hours.
2. Intravenous infusions of dextrose solution were given for their nutritive value, their diuretic effect, and their effect on the liver.

3. Vitamins B₁ and C were administered parenterally, on the empiric basis of possible deficiencies in these accessory dietary factors, although such deficiencies have not been demonstrated in nutritional edema.

4. Puncture of the swollen labia, under strict aseptic precautions, was carried out in several cases in which swelling about the vulva was a source of great discomfort.

5. A high protein diet was instituted for all patients who did not have digestive disturbances which contraindicated oral feeding.

6. Since such extreme deficiencies as were present in this group of cases cannot be corrected entirely, or even chiefly, by oral feeding, supplemental measures were instituted to repair the protein deficiency, such as whole blood, plasma, and amino acids.

In the 11 patients treated the response was excellent and prompt.

Stasis hypertrophy of the external genitals is a chronic enlargement of them, due principally to interference with the lymph circulation (Figs. 300 and 301). "Elephantiasis" is the term under which most authors describe this condition, but the import given to this word varies so much that its use leads

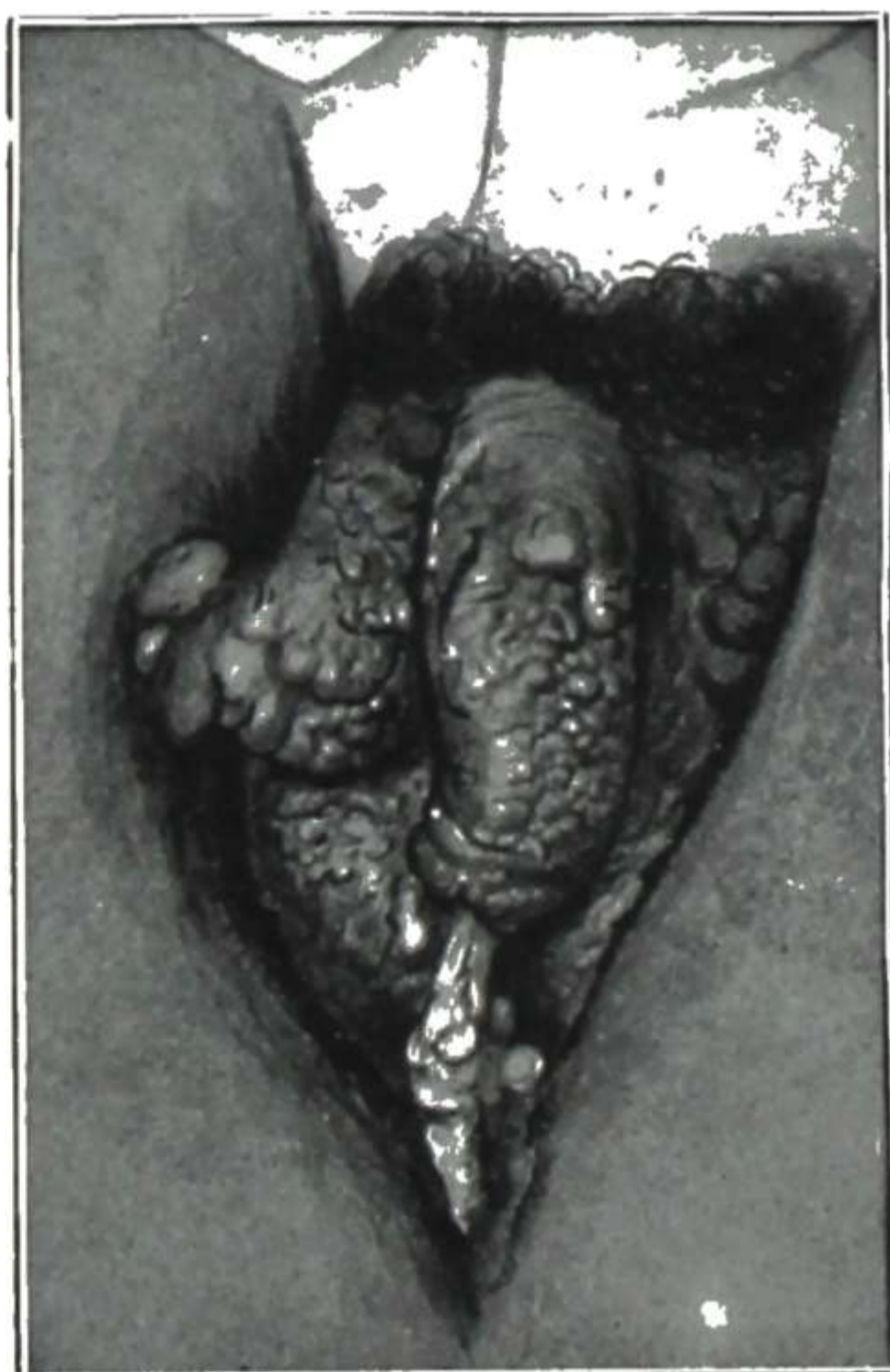


Fig. 300.



Fig. 301.

Figs. 300 and 301.—Stasis hypertrophy of the vulva. (From Hirst: *Diseases of Women*, W. B. Saunders Co.)

to confusion. It has been applied on the one hand indiscriminately to nearly all chronic enlargements of the labia and, on the other hand, as a special term for the designation of the swelling due to the local invasion of the lymph channels by a parasite (*Filaria sanguinis-hominis*). To prevent this confusion it is best to adopt another term, one about which there can be no misunderstanding and which indicates the most important factor in the evolution of the clinical picture. The essential lesion is a stasis hypertrophy, whatever the cause of the stasis may be.

Etiology.—There are three causative factors, as follows:

1. Chronic ulceration of the vulva. This has long been recognized as the etiologic factor in most cases. Syphilis is present in a high percentage of the cases, but any form of chronic ulceration may lead to it, as lymphogranuloma inguinale.

2. Obstructive changes in the inguinal lymphatic glands. The closing of the lymph channels through the glands may be brought about by extirpation of the glands or by their damage by suppuration.

3. Local invasion of the vulvar lymphatics by the *Filaria sanguinis-hominis*. This is rare or unknown in this country, but it occurs as an endemic affection in some countries (India, Barbadoes, and the Antilles). Mosquitoes and other blood-sucking flies deposit the embryo beneath the epidermis. There the parasite multiplies to such an extent as to choke the lymph channels, the obstruction being due to both the parasites proper and the ova.

Diagnosis.—Examination reveals the enlargement and usually also the ulceration and scar tissue. In the absence of infection, there are no acute inflammatory symptoms and usually but little congestion. The patients complain of some discharge and itching about the genitals and not infrequently symptoms of irritation on the part of the bladder and rectum. What usually brings the patient to the physician is the discharge and enlargement, with resulting discomfort and inconvenience in walking and difficulty in coitus. It must be differentiated from new growths and from hernia and from hypertrophies of special parts, as of the clitoris in masculinization or of the labia.

Treatment.—Stasis hypertrophy in temperate zones is practically always due to some type of chronic ulceration. Consequently, treatment calls for determination of the type of ulceration present and the adaptation of treatment accordingly. Occasionally excision of a troublesome mass is required along with the other measures.

Pudental Hernia

A pudental hernia is a protrusion of the intestine or omentum or other intra-abdominal structure into the external genitals. It may take place by way of the inguinal canal, in which case the hernia is designated as “inguinolabial” or “superior labial.”

The protrusion may take place by way of the vagina, in which case the hernia is designated as “vaginal,” “vaginolabial,” or “inferior labial.”

Inguinolabial Hernia.—The round ligament ends in the tissues at the top of the labium majus. In the fetus, the ligament is accompanied along the inguinal canal by a prolongation of the peritoneum, forming a small cavity. This is usually obliterated in the full-term fetus. In some cases, however, it is not obliterated but remains open, forming a small pocket or “canal of Nuck,” and along this canal an inguinal hernia may take place. The hernia may advance no farther than the inguinal ring or, on the other hand, it may protrude more and more, involving the upper part of the labium majus and later the whole labium (Figs. 302 and 303). It corresponds to scrotal hernia in the male and presents practically the same pathology and symptoms. In some cases other structures than the intestine or omentum have been found in such a hernial sac, for example, the ovary, fallopian tube, uterus, and even the pregnant uterus.

Vaginolabial Hernia.—In rare cases a hernial protrusion may take place through the pelvic outlet by way of the vagina (Figs. 305 to 307). In such a

case the hernia may descend in front of the broad ligament through the obturator foramen or between the uterus and the bladder, or behind the broad ligament, between the uterus and the rectum.

The latter type develops by pushing down the posterior peritoneal cul-de-sac between the vagina and the rectum. This "cul-de-sac hernia" (Figs. 304 to 307) is the most common form of vaginal hernia. It is prone to develop with prolapse of the uterus and may be mistaken for simple rectocele. Unless the associated cul-de-sac hernia is taken care of along with the prolapse operation, it will persist and give trouble later.

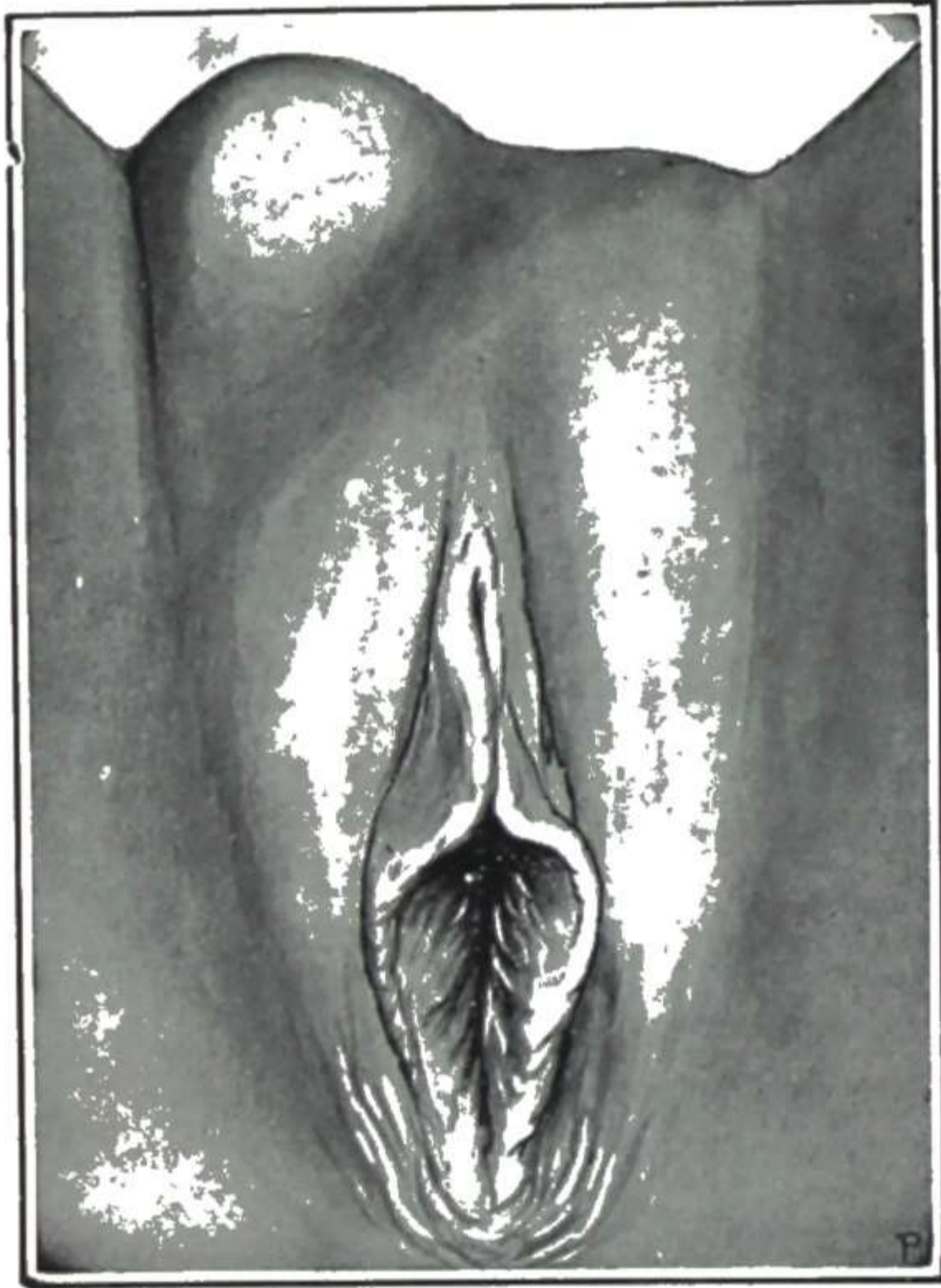


Fig. 302.

Fig. 302.—Pudendal hernia. Inguinal hernia becoming labial. (From Dudley: *Practice of Gynecology*, Lea & Febiger.)

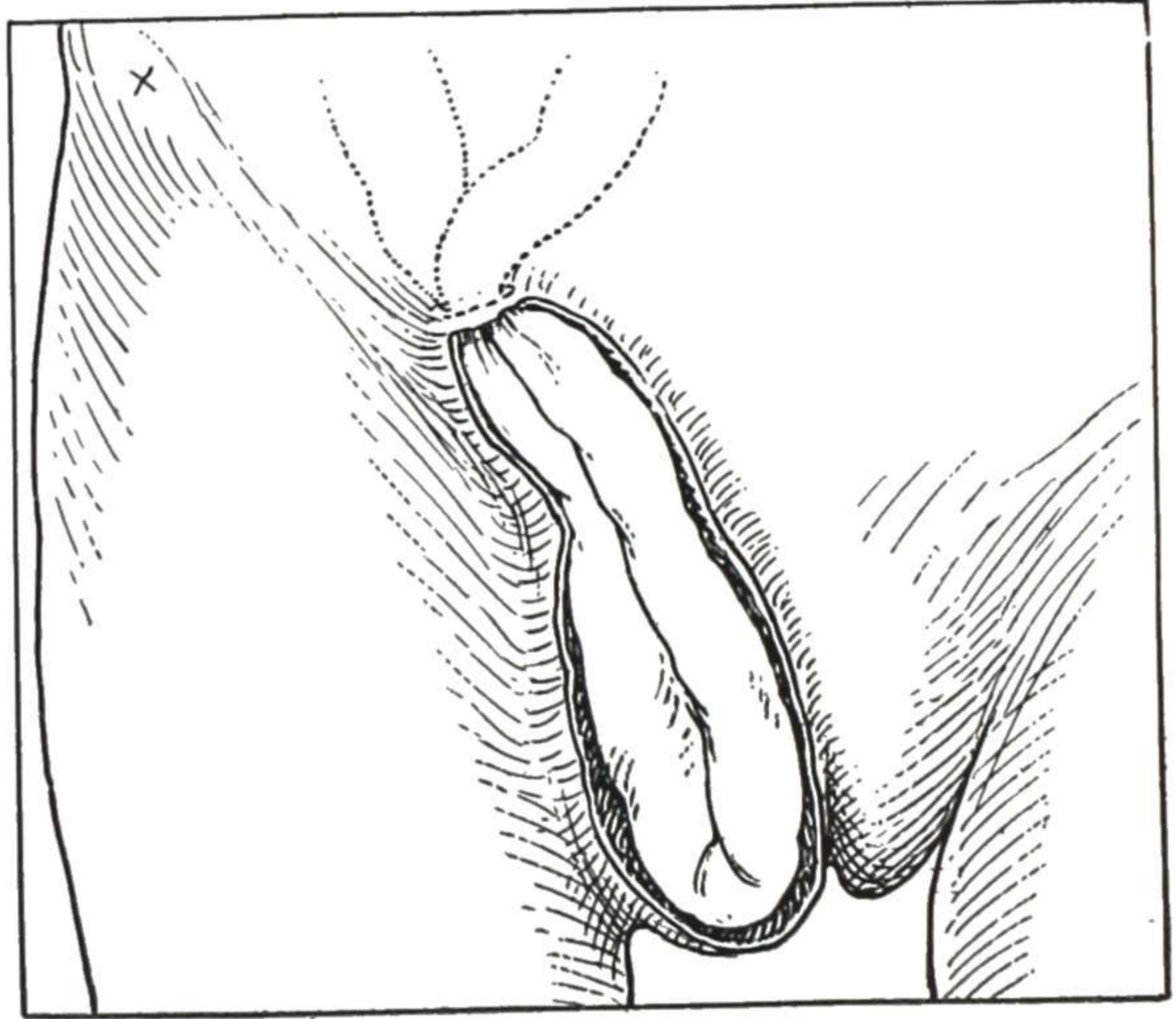


Fig. 303.

Fig. 303.—Inguinolabial hernia, diagrammatic.

Diagnosis.—Hernia differs from other swellings in this region, for example, hematoma, cyst, fibroma, stasis hypertrophy, cellulitis, in the following particulars:

IMPULSE ON COUGHING, which, however, may be absent if strangulation has taken place.

RESONANCE ON PERCUSSION is present only if the mass contains intestine. It is not found with omentum or ovary or tube.

MAY BE REDUCED INTO ABDOMINAL CAVITY.—This, of course, is possible only in reducible hernia. If the supposed hernia cannot be reduced with the patient in the dorsal position, she may be placed in the knee-chest posture and the reduction again attempted. This is especially effective in the vaginal form of hernia.

INTESTINAL OBSTRUCTION.—Usually there is not enough obstruction to produce serious symptoms or interfere with the passage of the intestinal contents, but when evidence of such obstruction does occur, it is a very important diagnostic symptom.

HISTORY.—Hernia usually appears in conjunction with some straining effort. Hematoma of the vulva is usually due to some external injury. Cellulitis follows a wound or ulcer. Stasis hypertrophy is preceded by chronic ulceration and scar-tissue formation. The other swellings of this locality (cyst, tumors) develop gradually and without apparent cause.

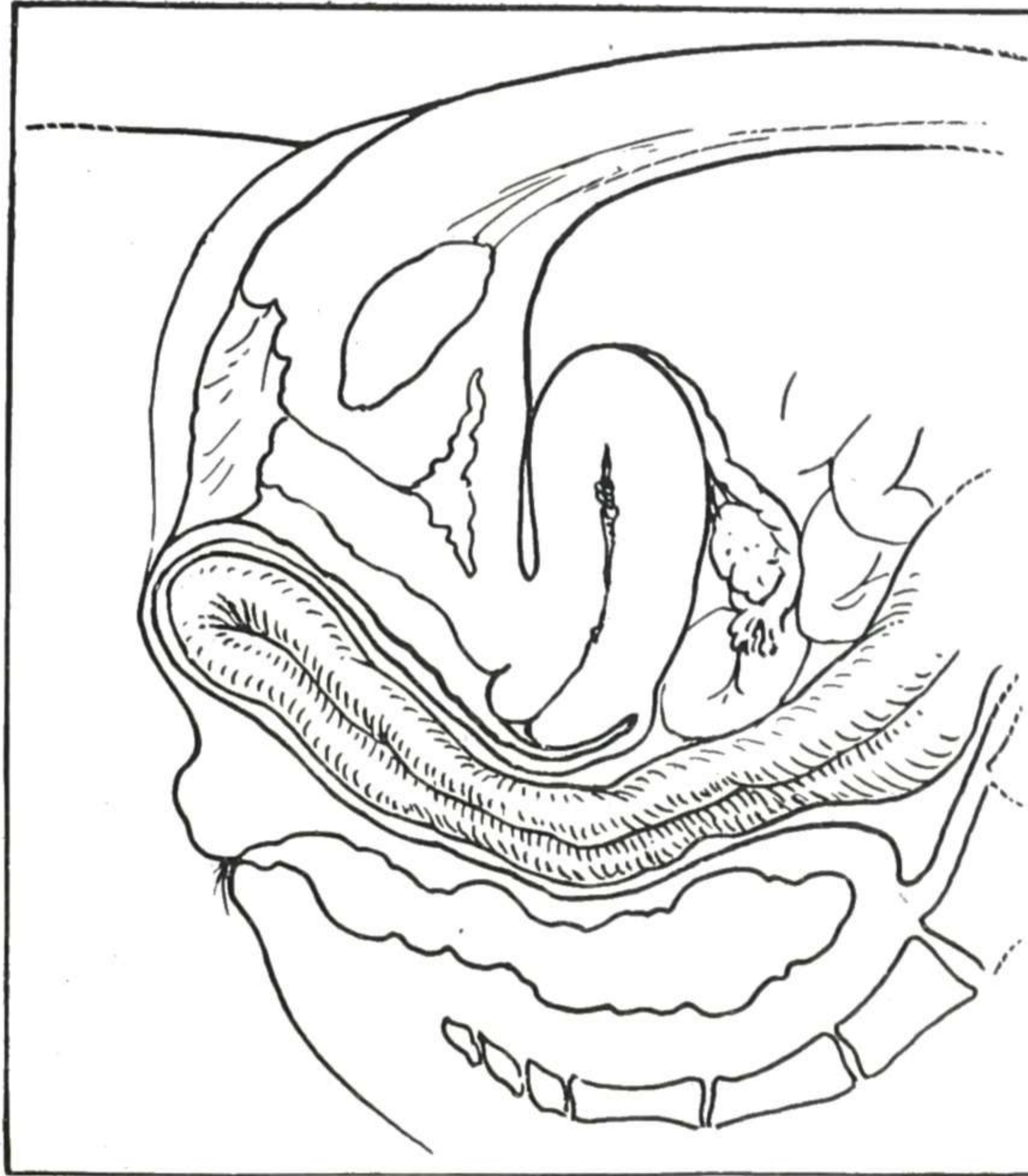


Fig. 304.—Vaginolabial hernia, posterior type (cul-de-sac hernia), diagrammatic.

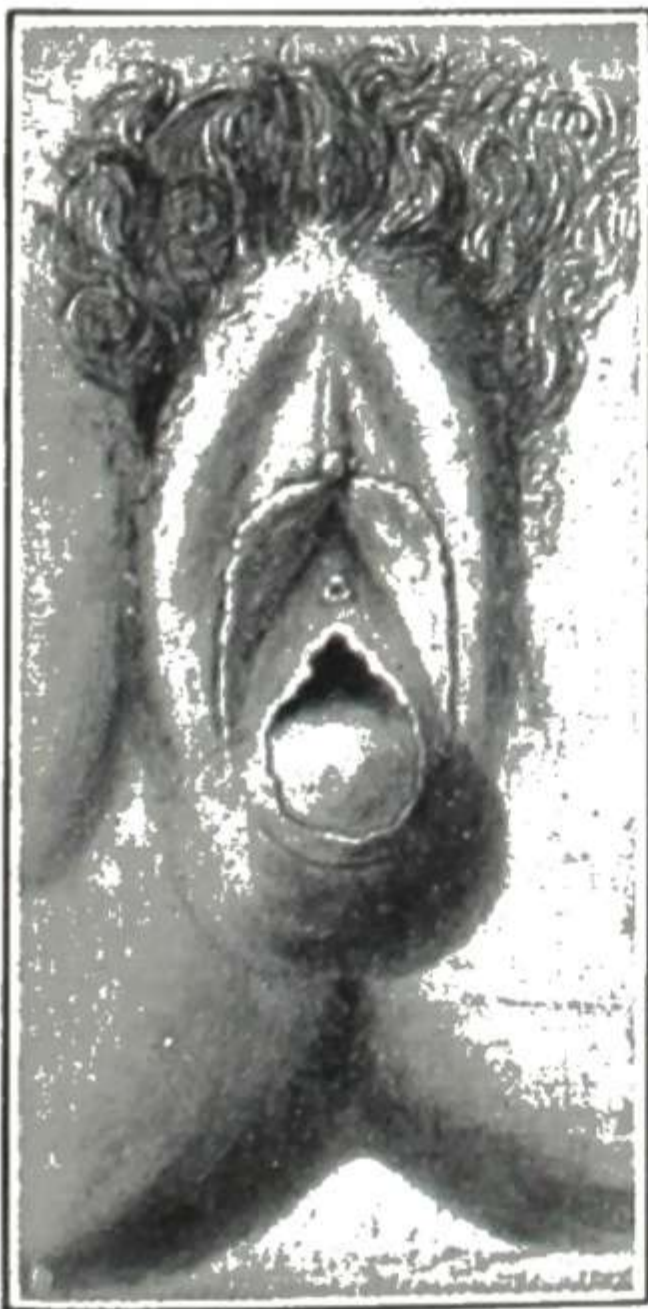


Fig. 305.

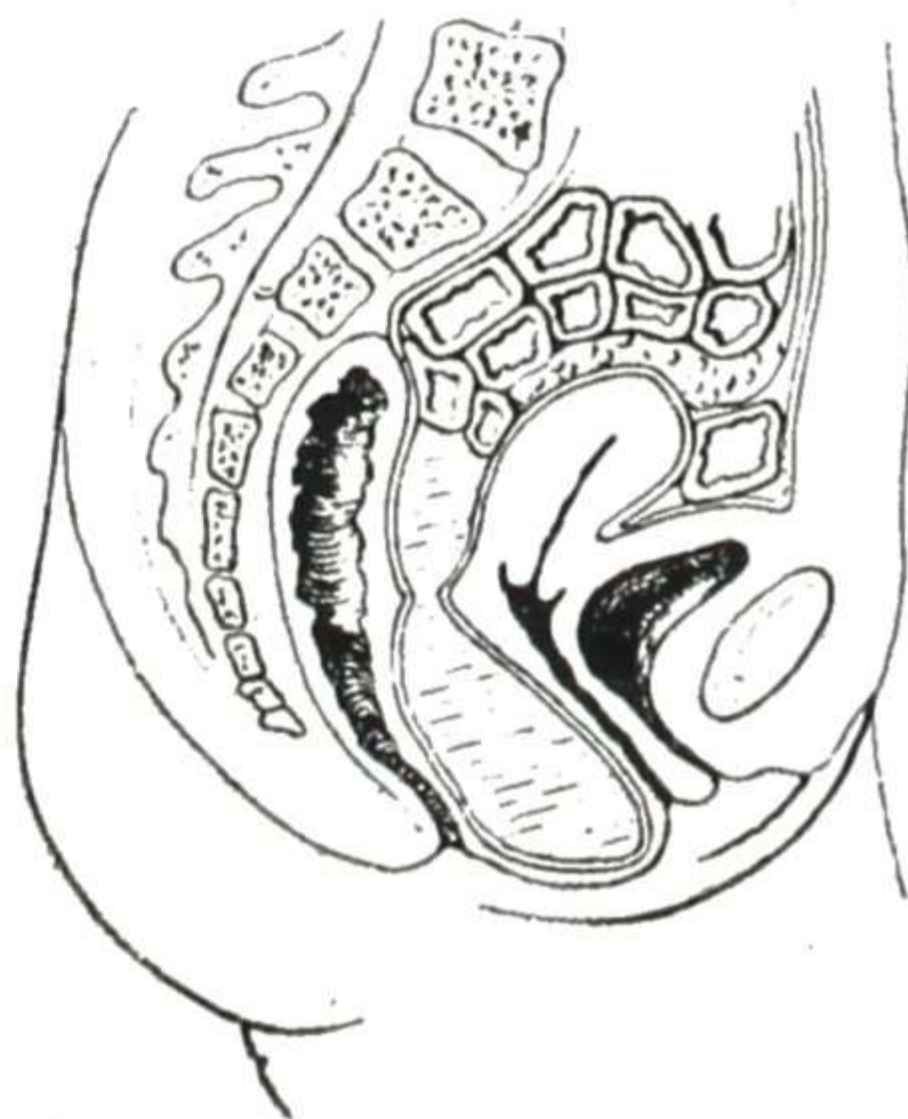


Fig. 306.

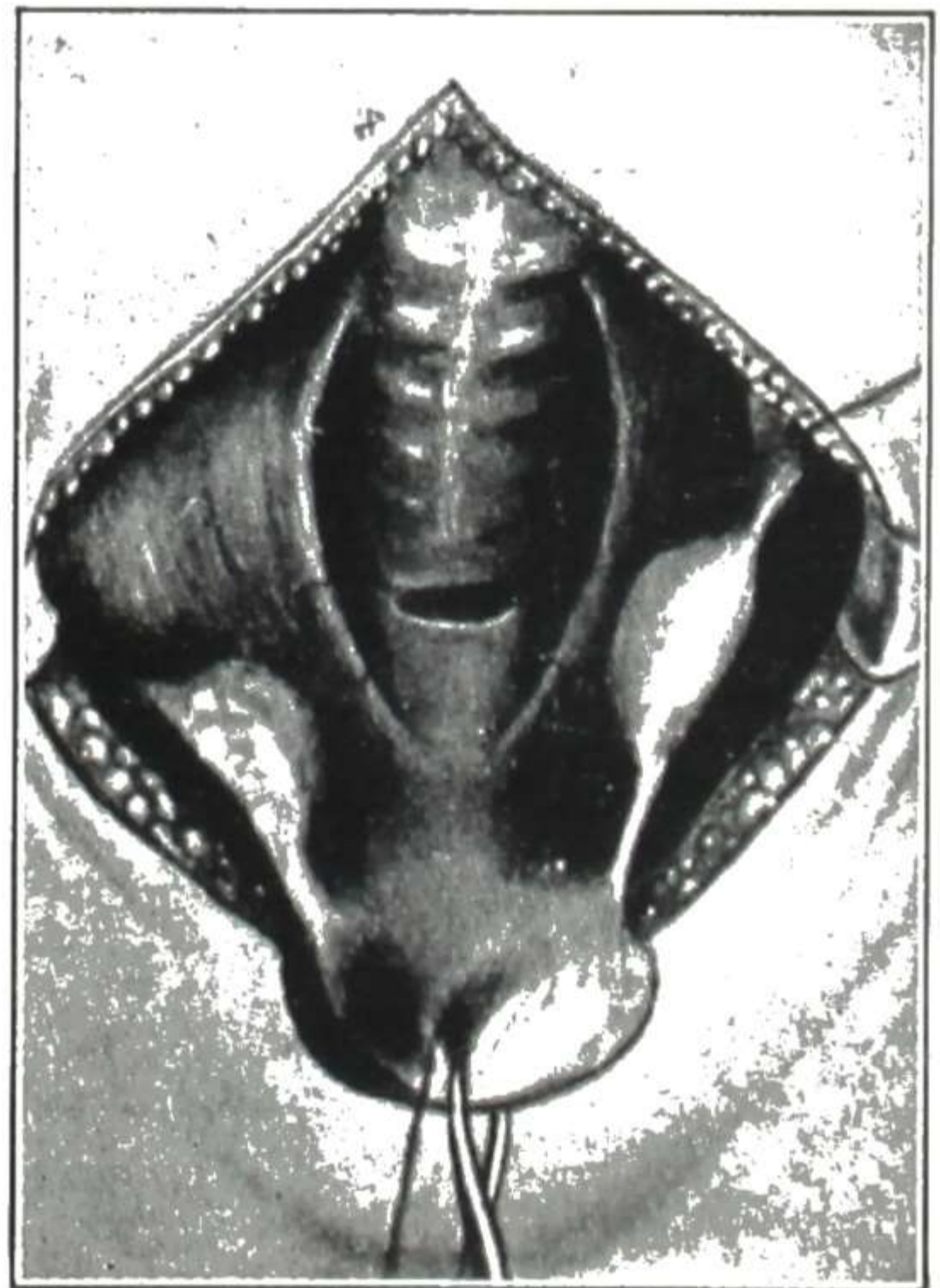


Fig. 307.

Figs. 305 to 307.—Case of vaginolabial hernia, posterior type (cul-de-sac hernia). Fig. 305. Appearance of genitals. Notice the distention of the posterior vaginal wall and the perineum. Fig. 306. Sectional view, diagrammatic, indicating the location of the hernial sac and the point of constriction. Fig. 307. Appearance internally with the abdomen opened. Notice the hernial opening at the bottom of the retrouterine peritoneal cul-de-sac. (From Sweetzer: *Ann. Surg.*)

Treatment.—The treatment for hernia in this situation is the same as for hernia elsewhere, namely, reduction and retention of the replaced viscera within the abdominal cavity, if that can be satisfactorily accomplished. An INGUINOLABIAL hernia can frequently be retained with the ordinary hernia truss. If the reduction cannot be accomplished or if satisfactory retention cannot be secured, then operation for the radical cure of the hernia is indicated.

In the form of pudendal hernia in which the protrusion takes place by way of the pelvic outlet and vagina (VAGINOLABIAL), there is seldom enough obstruction at the hernial opening to produce intestinal symptoms.

Pudendal Hydrocele

In some patients, a canal persists along the round ligament, the internal end of the canal being closed. If a collection of fluid takes place in the sac thus formed, the result is a pudendal hydrocele, corresponding to hydrocele of the cord in the male. It is called also "labial hydrocele" and occupies the same location as an inguinal hernia.

It differs from hernia in that it is dull on percussion, cannot be reduced, gives little or no impulse on coughing, is not associated with evidences of intestinal obstruction, and has developed gradually without apparent cause. Great care is necessary in diagnosing this rare affection, for it would be serious to mistake hernia for hydrocele and treat it by injection. It must be differentiated also from cystic adenomyoma of the round ligament. Several such cases have been reported. In hydrocele, the cyst wall would be thinner than in the cystic adenomyoma, though in some of the cases the adenomyoma can only be distinguished microscopically. Pudendal hydrocele must be differentiated also from hernia of the ovary with cystic degeneration.

Treatment.—If the collection of fluid is small and causes no inconvenience, leave it alone. If the swelling causes trouble, the sac may be opened and extirpated, and the wound closed by sutures. This is more certain of cure and much safer than injection treatment.

Varicose Veins

The veins about the external genitals may become markedly varicose, the irregular dilatation being due to some obstruction to the pelvic circulation, such as pregnancy or a pelvic tumor. The dilatation of the veins only rarely gives rise to troublesome symptoms. Sometimes the patient complains of itching or of tension in the parts. Sometimes she becomes alarmed on account of the enlargement and consults the physician simply to know the cause. Occasionally, however, there may be marked enlargement (Fig. 308), with aching in the parts and much irritation of the skin. The danger in these cases is that a severe hemorrhage may take place, or a large hematoma form from slight injury or from spontaneous rupture of a varicose vein (Fig. 309).

Treatment.—Usually no treatment is required beyond directing the patient to keep the bowels well open and to avoid lifting or straining as much as possible. Anything that increases the intrapelvic pressure or interferes with the pelvic circulation tends to increase the venous dilatation. In ad-

vanced pregnancy, an abdominal supporter takes some of the weight of the uterus from the anterior part of the pelvis and in that way may improve the circulation there. If the dilatation is sufficient to give the patient trouble.

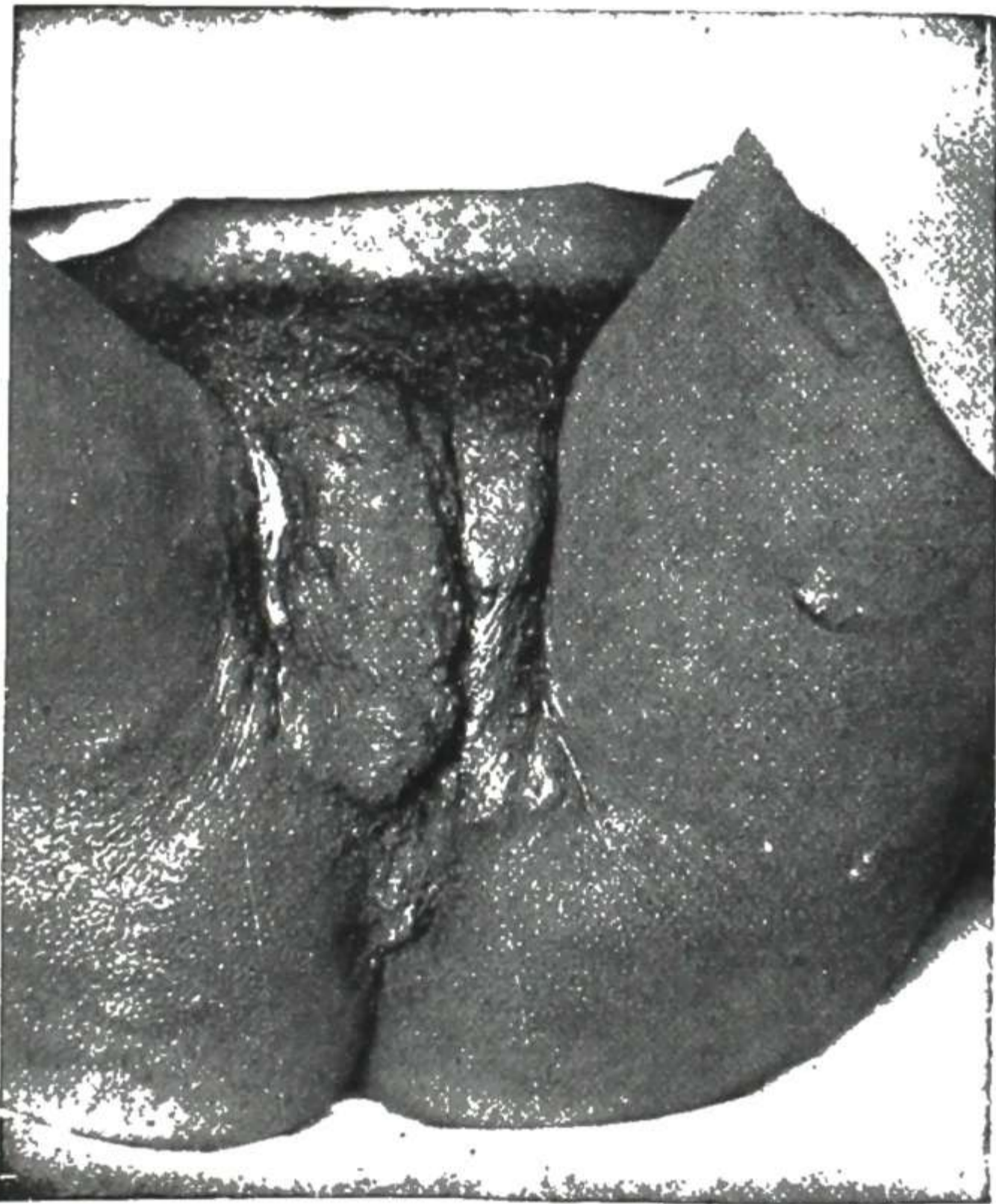


Fig. 308.

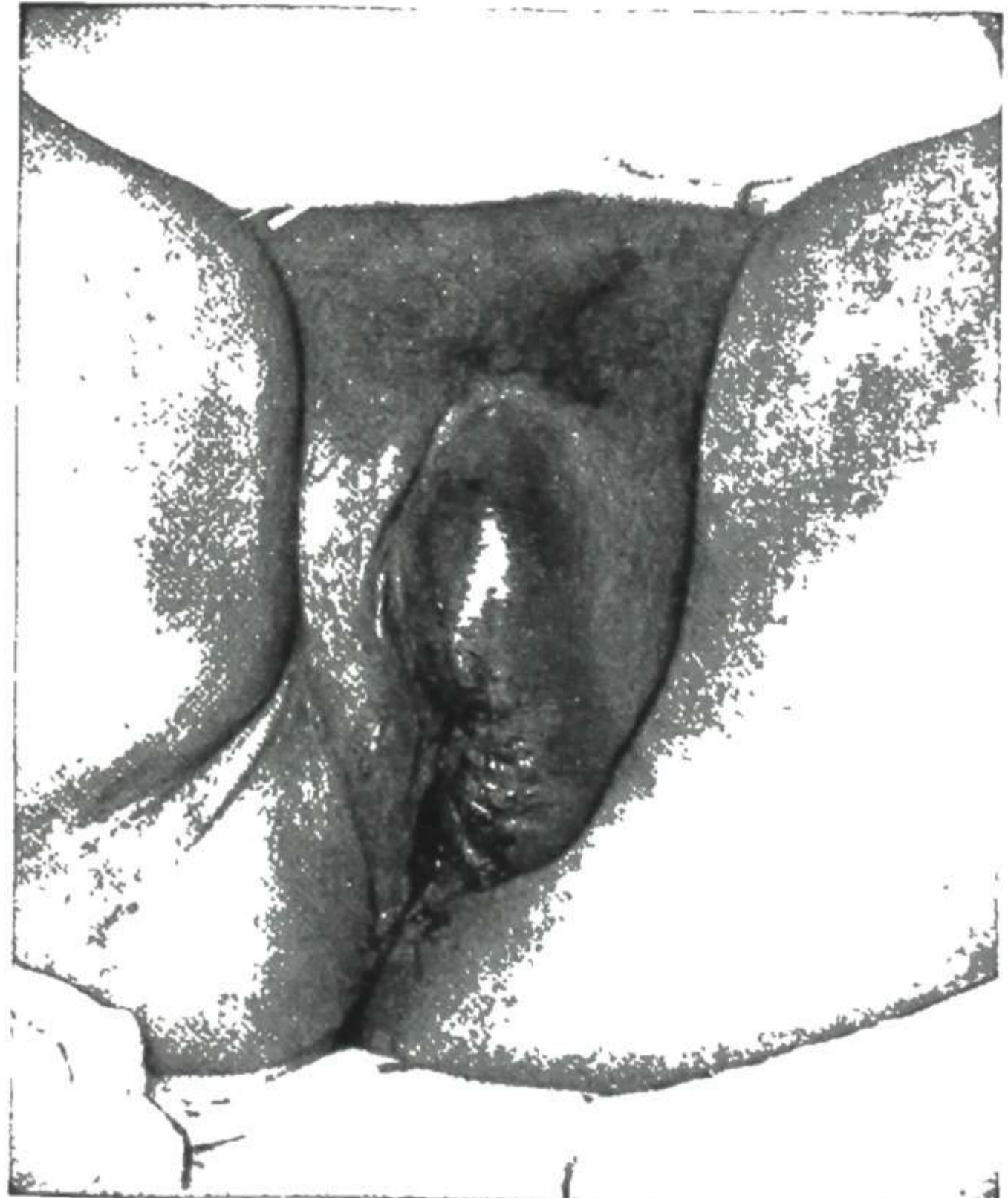


Fig. 309.

Fig. 308.—Varicose veins of the vulva. (From Hirst: *Diseases of Women.*)

Fig. 309.—Hematoma of the vulva. (From Hirst: *Diseases of Women.*)

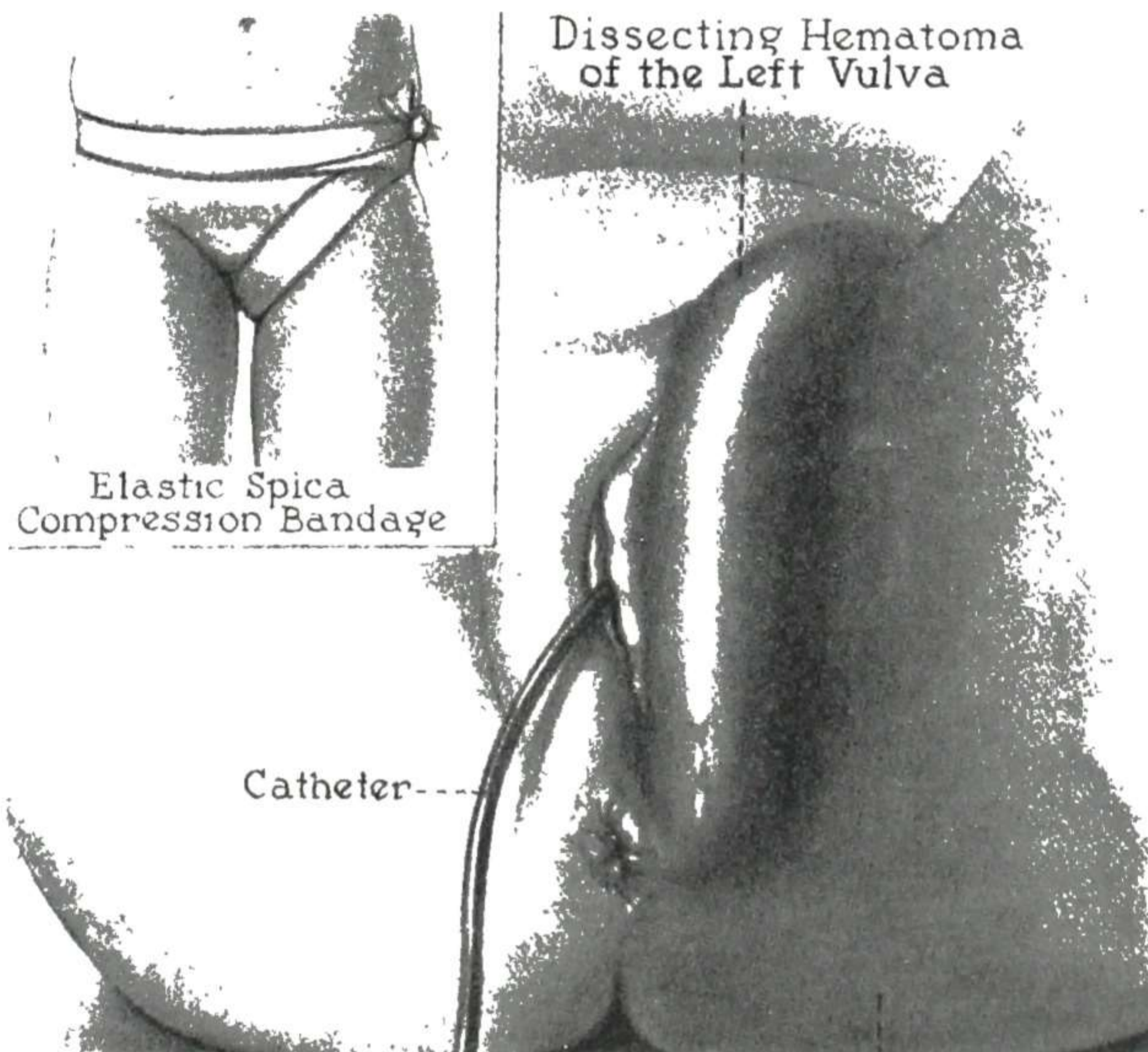


Fig. 310.—Spontaneous hematoma of left labia majora occurring two hours post partum. Inset shows method of treatment. (From Reich and Nechtow: *Am. J. Obst. & Gynec.*, June, 1951.)

some relief may be afforded by a pad and T-bandage, so applied as to support the veins and prevent further dilatation (Fig. 310). The patient should take the recumbent posture several times daily, and in some cases it may be ad-

visible to keep her in bed continuously in the later weeks of pregnancy. Recently there have been some reports on relief of varicose veins and the accompanying pruritus by use of a preparation of adenosine 5-monophosphate called My- β -Den (Bischoff), by Rottino. Intramuscular injection of 1 c.c. of a gelatine solution daily for three days, and then as needed, gives a sustained action for twenty-four to forty-eight hours.

If there should be subcutaneous rupture of a vein, employ the treatment given under Hematoma.

If there should be external rupture, employ the treatment given below for open hemorrhage following injury.

When in the nonpregnant patient the veins are so much enlarged that they are troublesome, they may be excised. They are exposed by an incision through the skin covering them, the affected veins are isolated and ligated at each end and excised, the stumps are brought together, and the incision is closed by sutures.

Nonmalignant Tumors

The benign tumors of the vulva may be of connective tissue or epithelial origin. Those of connective tissue origin are: fibromas, fibromyomas, lipomas, myxomas, neuromas, lymphangiomas, hemangiomas, and chondromas. Those of epithelial origin are condylomata which have been considered true papillomas, sweat gland tumors or hidradenomas, epidermoid cysts, moles, and rare tumors such as accessory breast tissue, endometriosis, and embryological rests. Any of these tumors may become malignant.

About 30 to 35 per cent of the connective tissue tumors arise from the extraperitoneal portion of the round ligament. The fibromas though rare are the commonest of those arising from connective tissue. They usually become pedunculated, and because of the varying conditions to which their blood supply is subjected they frequently undergo degenerative changes, myxomatous and other. In Leonard's series of 103 cases 20 per cent were sarcomatous and in Hellman's series 22 per cent were malignant, hence the importance of removing these tumors early. These tumors vary in size from that of an acorn to that of a child's head. Two cases are shown in Figs. 311 and 312.

Of the epithelial tumors sebaceous cysts occur on the labia majora or the mons veneris. They present the same characteristics and require the same treatment as sebaceous cysts elsewhere. Other cysts occur from remnants of fetal structures. Cysts of the vulvovaginal gland are considered later.

Several cysts of the labia minora have been reported (Fig. 313). It is generally supposed that they arise from embryologically misplaced glandular rests. If large enough to be troublesome, they are to be excised. Fig. 314 shows a cyst of the clitoris. In recent years the hidradenoma has been the subject of a good deal of discussion. It has long been considered to arise from sweat glands, but, as Novak and Stevenson have recently pointed out, the apocrine origin of these tumors is difficult to prove in all cases. Though the



Fig. 311.

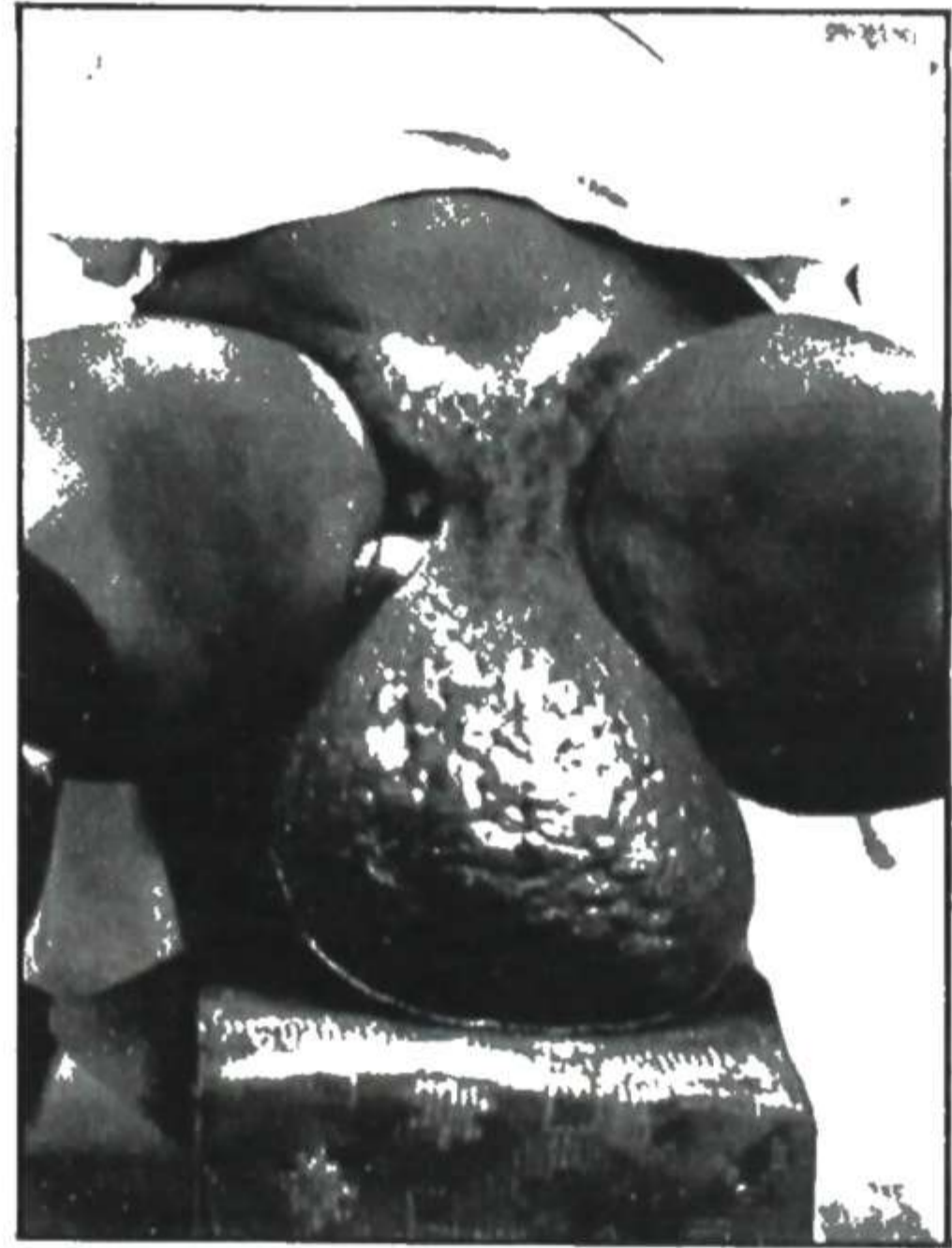


Fig. 312.

Fig. 311.—Pedunculated fibroma of vulva arising from minor labium. (From Faulkner and Douglass: *Essentials of Obstetrical and Gynecological Nursing*, The C. V. Mosby Co.)

Fig. 312.—A large fibroma of the labium. (From Montgomery: *Practical Gynecology*.)

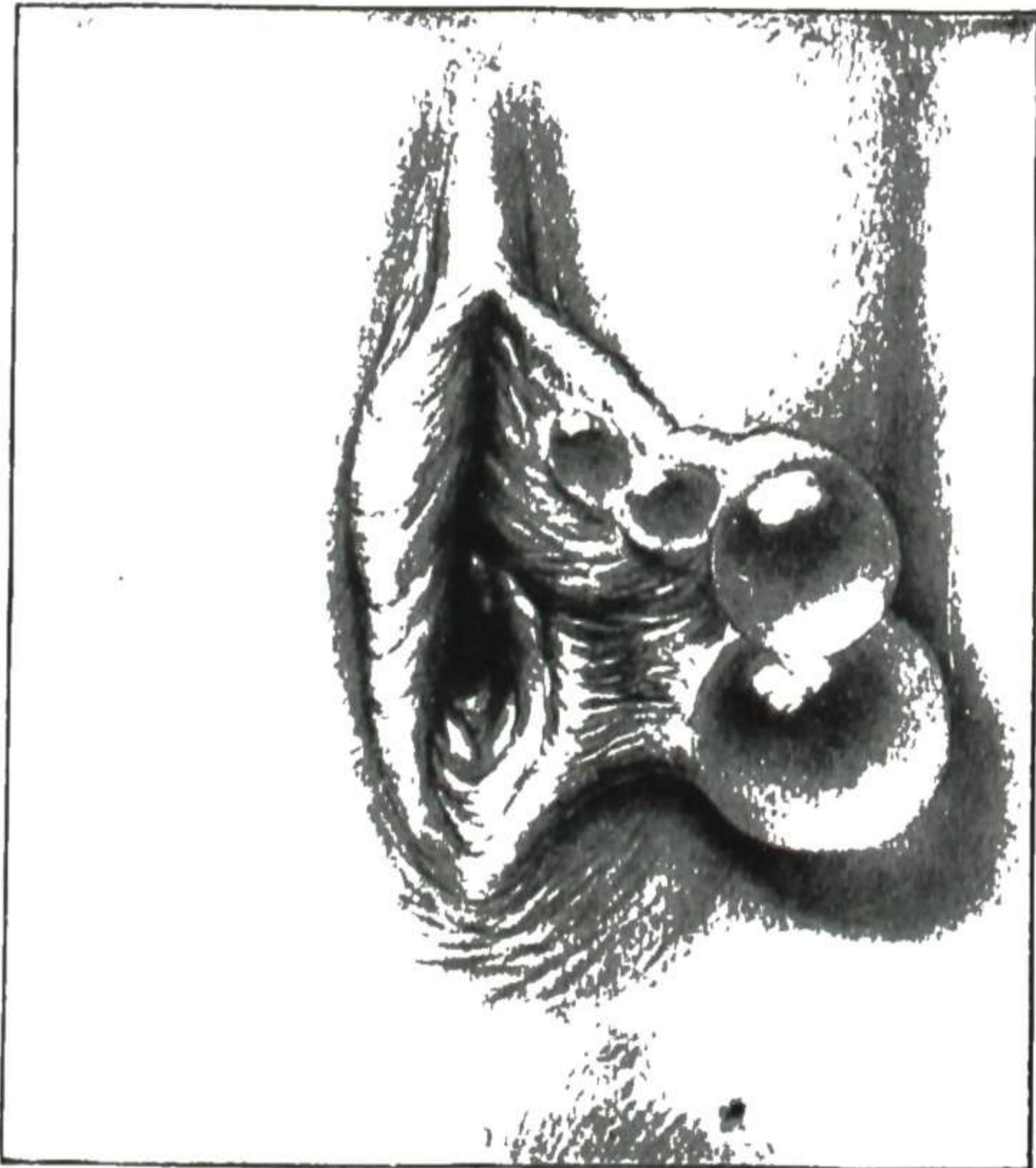


Fig. 313.

Fig. 313.—Small cysts of the left labium minus. (From Kelly: *Operative Gynecology*.)

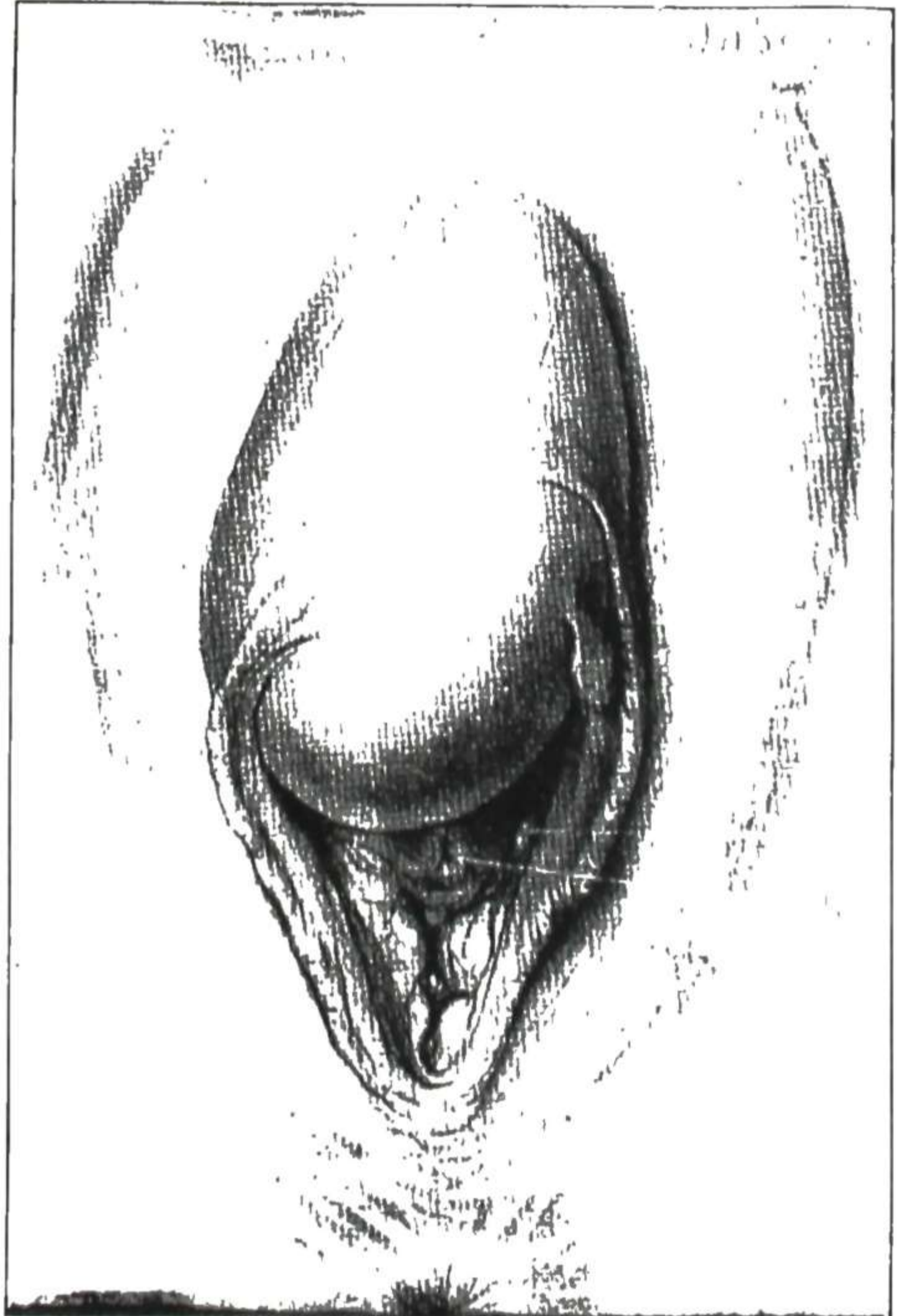


Fig. 314.

Fig. 314.—A cyst of the clitoris. (From Kelly: *Operative Gynecology*.)

histologic picture resembles that of malignancy, only one proved case of malignant change has been reported. The treatment is simple excision.

Three cases of Paget's disease of the vulva, a very rare condition, were recently reported by Huber et al.

Injuries of External Genitals

The genitals are in such a well-protected situation that injuries are rare. Such injuries as do occur, apart from labor, are due usually to a fall astride some object or to kicks and blows intentionally inflicted, or to injuries from coitus.

Injuries in this locality should be treated on the same general principles that govern the treatment of injuries in other localities; viz., stop hemorrhage, secure asepsis as far as possible, approximate divided tissues sufficiently to restore function, and afterward protect the wound with a suitable dressing.

There are two special characteristics of injuries in this locality that must be kept in mind:

1. **Free Hemorrhage.**—The parts are very rich in blood vessels, particularly veins, and slight injury may cause severe bleeding, either as external hemorrhage from an open wound or as subcutaneous hemorrhage from a bruise, giving rise to a hematoma.

An instance of troublesome hemorrhage from a slight injury is the persistent bleeding that occasionally follows the small tear of the hymen in the first coitus. On account of modesty and embarrassment, the newly married couple hesitate to call in assistance, and sometimes the bleeding persists for hours—until they do finally call a physician, who may find the bedding soaked with blood and the bride almost exsanguinated.

OPEN HEMORRHAGE from injury to genitals should be stopped by packing or by sutures or by forceps or by ligature of separate vessels or by ligature of the bleeding tissue en masse, as indicated by the nature of the wound. After treatment of the wound, the patient should be kept in bed with hips elevated until all tendency to hemorrhage is past. In attempting to stop hemorrhage, either from a wound or during an operation, if the bleeding vessels cannot be made out and the bleeding is free, the most satisfactory plan is to pass one or more sutures through the bleeding area and tie them.

In case of injury about the venous masses called the bulbs of the vestibule, the hemorrhage, whether open or subcutaneous, may often be controlled by packing the vagina firmly and then putting a firm compress over the vulva, such as a folded towel held in place by a strong T-bandage, making firm pressure.

IN SUBCUTANEOUS HEMORRHAGE (hematoma) the patient should receive the treatment described elsewhere for that affection.

2. **Marked Swelling.**—In this locality the subcutaneous tissues are loose and decided swelling is liable to follow an injury, either immediately from subcutaneous hemorrhage or serous effusion or later from inflammatory exudate.

To prevent the swelling, or diminish it if present, put the patient to bed, elevate the hips, and apply an ice bag over the parts. If the swelling is from inflammation, hot applications may give more relief than the cold. Antibiotics are used to control infection.

Hematoma of Vulva

A hematoma is a collection of blood in the tissues. The genitals are very vascular and also present much loose subcutaneous tissue into which hemorrhage may take place with but little resistance until a large mass is formed (Fig. 309).

After some slight injury, a swelling is noticed, which increases rapidly in size and is accompanied by considerable pain, especially when the patient is standing. If large, the swelling distorts the parts very much, in some cases so much that the individual structures are identified with difficulty. The swelling presents induration and, if a large collection of blood has formed, there may be fluctuation.

Treatment.—Put the patient to bed and elevate the hips by placing a pillow under them, at the same time arranging a pillow under the knees so that the patient will be comfortable, and apply an ice bag over the swelling and strapping as shown in Fig. 310. The patient should be kept perfectly quiet in this position until the hemorrhage ceases—several hours if necessary. If there is much pain, sedatives should be given to keep the patient quiet. The cessation of the hemorrhage is indicated by the swelling ceasing to increase in size and by diminution in the pain.

If the hematoma is very large or increasing in size, it is advisable to incise the swelling, under antiseptic precautions, turn out the clots, ligate the bleeding vessel or vessels, cleanse the cavity, and obliterate it with sutures.

MALIGNANT DISEASE OF THE VULVA

Cancer of the external genitals includes carcinoma (usually of the squamous-cell type), chorionepithelioma, and sarcoma.

Carcinoma

Carcinoma of the vulva is found in about 3 per cent of cases of cancer of the genital tract. The relative frequency of vulvar cancer to uterine cancer varies in different series from 1 to 20 to 1 to 30. The greatest incidence of cancer of the external genitals is between the ages of sixty and seventy, but it may occur at any age. The average at which the patient was first seen for four reported series, comprising a group of 559 cases, was a little less than 59 years. The lowest average age, 53.4 years, was reported by Lunin, and in his group 62 per cent of the patients were of the Negro race. Lash and Zibel report a case in a twenty-six-year-old Negro.

The complaints given by the patient in order of frequency were pruritus, swelling or ulcer (usually painful) discharge or bleeding. Taussig was the first to emphasize the importance of leukoplakic vulvitis as a precursor of carcinoma of the vulva and in his early series 50 per cent of the cases were on a leukoplakic basis; an example of this is shown in Fig. 315. Though this

has been the general finding, leukoplakia was found in only 12 per cent of 313 cases reported by Palmer and his associates, and Lunin found leukoplakia present in only 18 per cent of his fifty cases. Other lesions which were present included venereal disease: syphilis, lymphogranuloma venereum, chancroid, and others, and these were all found in the Negro patients. Other causes are chronic Bartholin infections, moles, chronic irritation, mechanical or inflammatory.

Taussig classifies carcinomas of this region into four groups, based on the point of origin, as follows: (1) Epidermal cancer, springing from the skin. Its most frequent site is the prepuce. Microscopically it is evident that the growth is a skin cancer. The characteristics are shown in Figs. 316 and 317. (2) Carcinoma of the clitoris. This is a subdermal tumor of extreme malignancy. Histologically the cells resemble sarcoma cells. (3) Vestibular cancer, arising usually from the urinary meatus. Histologically it reproduces the tissue from which it springs. (4) Bartholin gland carcinoma.

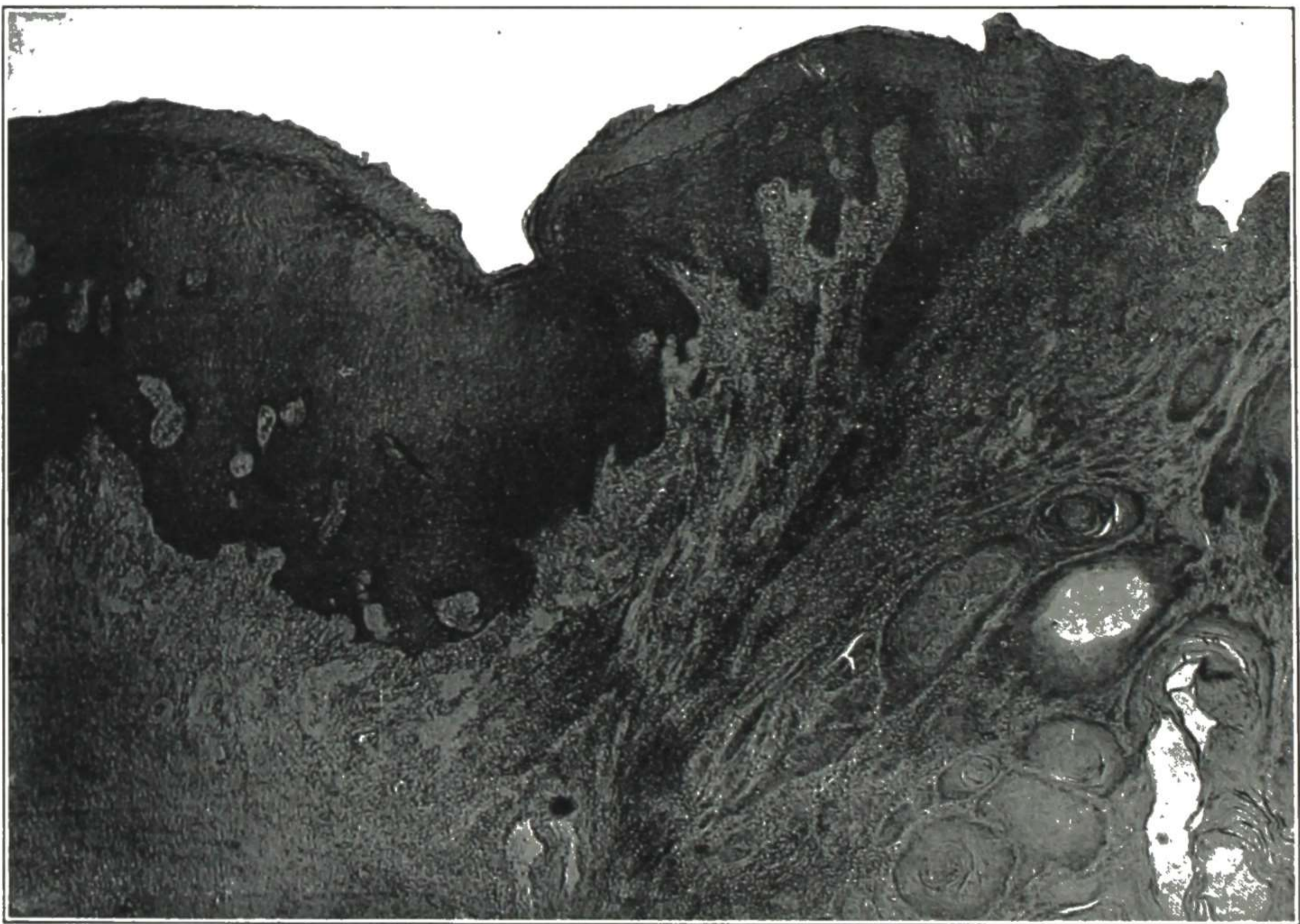


Fig. 315.—Leukoplakic vulvitis with beginning carcinoma. The leukoplakia is in the stage of epithelial hypertrophy which precedes marked atrophy. This is an excellent example of a squamous carcinoma beginning on a leukoplakic base. Gyn. Lab.

Carcinoma of the Bartholin gland is one of the rarest of genital malignancies. When the case shown in Figs. 318 and 319 was reported, we reviewed the literature on the subject up to 1948. There were eighty-eight cases in the entire world literature, of which thirty-seven had no report on the final outcome. There were four cases of sarcoma. There were fourteen patients who died or had recurrence within three years of treatment, and only seventeen of the remaining thirty-three cases had been followed more than three years. The type of procedure done and the survival times are shown in a table in the article.

Carcinoma of the Bartholin gland should be considered as a possibility in any case of enlargement of the gland. Twenty-two per cent of the cases occurred under thirty years of age and 25 per cent were over sixty. The signs and symptoms in order of fre-



Fig. 316.—Carcinoma of the vulva. High power, showing a portion of the leukoplakic epithelium above and a nest of carcinoma cells below and to the right. Gyn. Lab.



Fig. 317.—Carcinoma of the vulva. Higher power of the nest of carcinoma cells, showing the variation in size, mitoses, and pearl formation. Note the round cell infiltration at the periphery. Gyn. Lab.

quency were: tumor, usually cystic and sometimes painful, and abscess with draining sinus accompanied by itching or tenderness.

Homan gave four diagnostic criteria for carcinoma of the Bartholin gland: typical vulvar site, position deep in the labia, connection with gland duct, and presence of intact gland tissue.

Because of the paucity of cases no conclusions can be drawn concerning prognosis or type of treatment. As can be seen in the table of the five patients who were still living after five years, four had had simple wide excision.

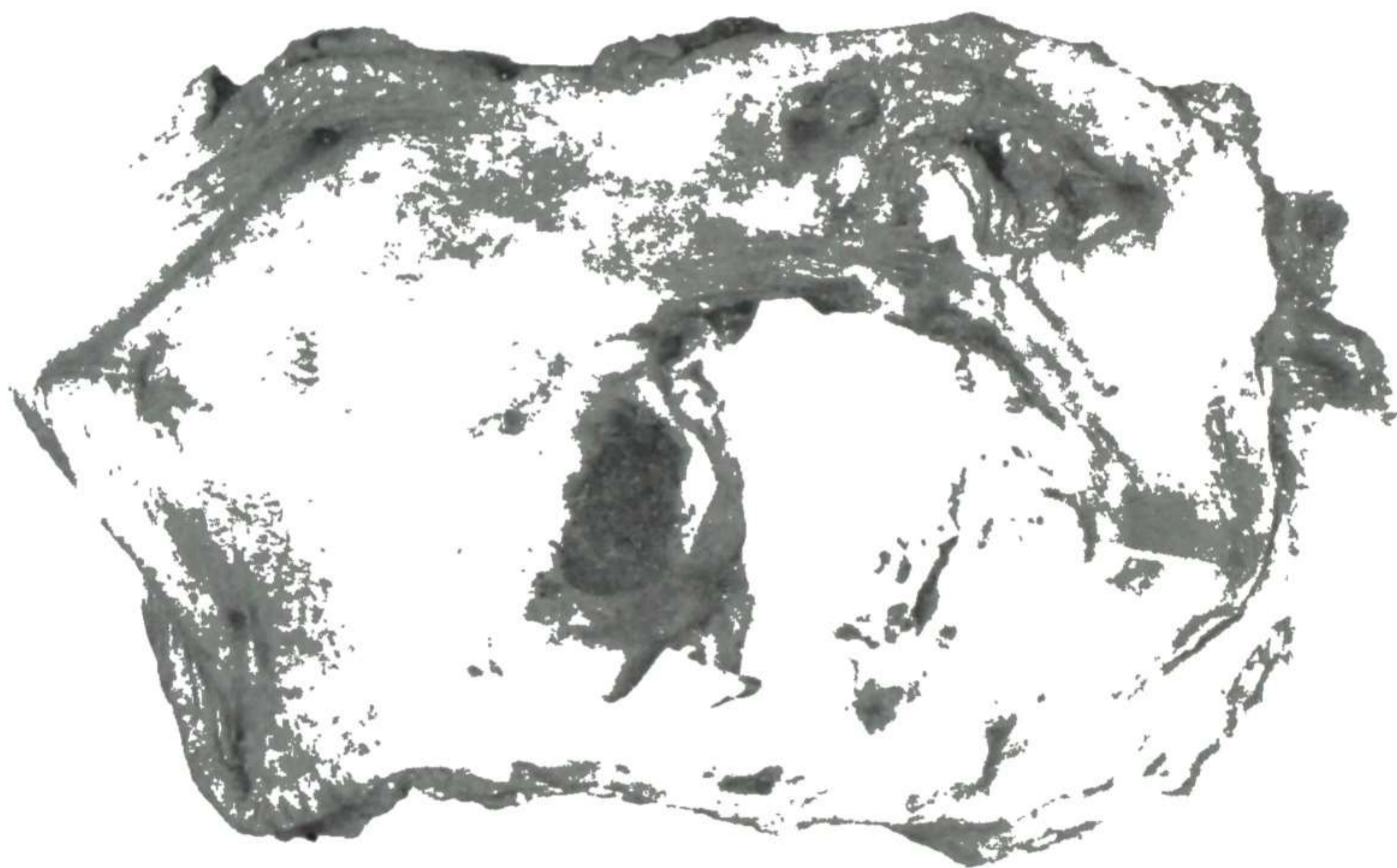


Fig. 318.—Specimen from the vulvectomy. In region of the right Bartholin gland there is a raised, firm area 1 cm. in diameter with superficial ulceration as shown. The clitoris can be seen above in midline. (From Crossen: *Am. J. Surg.*, April, 1948.)

Epithelioma is the most frequent form. This begins usually on the lower portion of the labium majus as a small hard nodule with a bluish tinge, especially about the edge. The nodule grows slowly and at first may produce no symptoms. In some cases, however, even from the first there is severe pruritus. After a time, part of the nodule breaks down, forming a small ulcer which is surrounded by an area of induration (Figs. 320 to 323). There is a watery discharge sometimes mixed with blood. It may begin in the labium minus or in the clitoris (Fig. 320). After the malignant induration breaks down and ulcerates, the progress is rapid. The adjacent surfaces become involved in the destructive process, and in the later stages a large fungating mass may form. Fig. 324 is a photograph of a very extensive case of vulva cancer of three years' duration. This patient had a wide vulvectomy with bilateral gland resection, including those on each side of the iliac vessels as they passed under Poupart's ligament. She is alive and well six years later.

The relation of chronic vulvar irritation, particularly leukoplakic vulvitis, to the origin of cancer is indicated in the illustrations.

The inguinal glands become enlarged early, at first simply from the lymphatic enlargement that always takes place when there is inflammation or persistent irritation of the genital region. Later the glands become infiltrated