

less common to the various forms of ulcer, subject to modification depending on the etiology, will next be described.

Granulating or Healing Ulcer.—All ulcers which have reached the healing stage, irrespective of their cause, present practically the same appearance. The shape is round, or that of the original injury. The base is of a light-red color, even with the edges, or slightly depressed, not tender, and showing no evidence of hemorrhages. It should be covered with medium-sized, regular, even granulations. The edges are soft, shelving, not thickened, and marked by a bluish-white border of newly formed epithelium, which is spreading over the surface of the ulcer from the epithelium of the skin, and will finally cover the surface. The peculiar bluish-white color of this border is due to the presence of new blood-vessels which show through the translucent young epithelial cells. The surrounding area is soft, and not inflamed. The discharge is slight in amount and consists of a thick yellowish purulent material which is really not pus, as it is not the result of the death of leucocytes in an effort to combat infection; it is due rather to the throwing off, from the surface, of the unnecessary cells formed as a result of overproduction. The discharge is not very irritating and contains very few bacteria. An ulcer in this stage is not painful.

Spreading Ulcer.—Either from the start or later, as a result of a new infection or of some other complication, an ulcer may begin to increase in size. Its shape becomes irregular. The base is uneven, is gray or of a dirty-yellow color, and may be blood-stained. The process of degeneration is greater than that of repair, and there are no granulations. The edges may be thickened, by reason of the presence of an inflammatory exudate that forms while the ulcer is spreading slowly, or thinned out and undermined, on account of the rapidity with which the ulcer is spreading. The discharge is increased in amount, is thin, semipurulent, contains more or less debris thrown off by the rapid death of tissue, and is often foul and irritating. When such an ulcer becomes inflamed, the base, edges, and surrounding tissues become red, congested, and the site of a cellulitis. Often phlebitis, periphlebitis, and acute eczema are present. There



FIG. 4824.—Chronic Traumatic Ulcer, showing Raw Base, Absence of Granulations, and Thickened Adherent Edges.

are pain and throbbing in the part, and the discharge becomes profuse, purulent, and often blood-stained.

The variety of spreading ulcer, known as *sloughing ulcer*, is particularly apt to occur in old persons of low

vitality, with senile leg ulcers that have developed after exposure. The base is irregular and covered with sloughs or even with small areas of gangrene. There are no granulations. The edges are irregular, excavated,

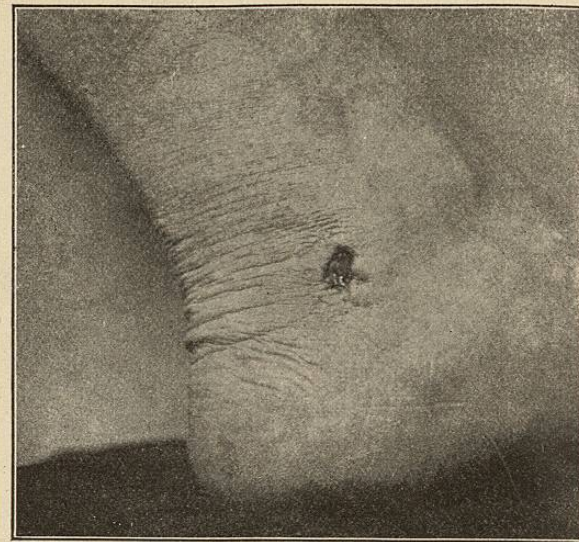


FIG. 4825.—Typical Erythematous Ulcer, showing Usual Situation and Appearance.

sloughing, and necrotic, or may be gangrenous in small areas. The discharge is profuse and foul, and contains the products of necrosis. Those very rapidly spreading cases, known as *phagedenic ulcers*, are fortunately, since the development of aseptic surgery, rare. They occurred in hospital gangrene, in some cases of venereal infection, and were more apt to be found in tropical climates, and where the patient was weakened by fever and disease. A severe grade of infection acts as the exciting cause. The base is irregular, sloughing, and covered with a grayish, fetid, pulpy material. There may be large areas of gangrene. The edges are thinned out and undermined, the subcutaneous tissues disappearing before the skin, and are often gangrenous in places. The discharge is very foul and irritating.

Chronic Ulcer.—Any ulcer may, from a variety of causes, fail to heal and become chronic. The most usual position, however, in which these ulcers are found is on the inner side of the lower third of the leg. They show great variety in size, shape, and appearance of base, edges, and surrounding area, and in accordance with these differences many different names are applied to them. The size varies from the small ulcer less than 1 cm. in diameter, sometimes found with varicose veins, to the large ulcers which surround the leg, and which are called *annular ulcers*. They may be round, very irregular, or funnel-shaped, as in *perforating ulcer of the foot*. The base may be much or slightly depressed, or the granulations may be at a higher level than the surrounding edges. When the granulations are large, irregular, and bleed easily, they are spoken of as *exuberant* or *fungating*; when pale, soft, and flabby, as *weak* or *oedematous*; when small and slowly growing, as *indolent* (Plate LVII, Fig. 5). Sometimes the base is covered with a grayish or yellowish-white necrotic layer formed of fibrin and necrotic cellular elements. When this layer is removed no granulations appear, but instead a smooth shining base resembling mucous membrane. This form is known as the *croupous ulcer*. In some cases the base of the ulcer is formed of the body tissues (muscle or connective tissue), and the lesion may look like a fresh injury. These are called *raw ulcers*. The base of a chronic ulcer may be pigmented. The edges also vary greatly. They may be irregular or sharply cut, moderately thickened,

or very much so, due to chronic congestion and oedema, with enlargement of the papillae and proliferation of the epithelial cells. When this is a prominent feature the name *callous ulcer* is applied. The edges may be adherent to the deeper structures and thus prevent contraction and healing (Fig. 4824); they may be rounded, elevated, undermined, or overhanging. Usually they are of a uniform height, rarely worm-eaten. When a chronic ulcer shows no tendency to heal it is never shelving, and there is an absence of the bluish-white border, mentioned in connection with healing ulcer. The discharge from a chronic ulcer is usually slight in amount, serous in character, and contains very few pus cells. The surrounding area may be swollen, red, congested, oedematous, eczematous, pigmented, or the ulcer may be surrounded by smaller ulcers, vesicles, or masses of varicose veins. As a rule there is an absence of severe pain accompanying chronic leg ulcers, unless there is an exposure or involvement of some nerve filaments. But frequently, after the patient has been on his feet for a long time, there is a dull aching sensation in the part, due to chronic congestion, which causes tension in and about the ulcer.

A peculiarly painful form of chronic ulcer is found over the inner malleolus, most frequently in women of middle age, although it also occurs in men. It is often associated with varicose veins, and in women with menstrual disorders. It is known as a *congested, irritable, or erythematous ulcer* (Fig. 4825). These ulcers begin as a small area of congestion over the internal malleolus. This area gradually increases in size, and becomes darker and more dusky in the centre, due to a deposit of blood pigment caused by the chronic congestion. The skin next becomes hard, dry, scaly, and pigmented, while the subcutaneous tissues lose their elasticity, becoming inflexible, hard, and adherent to the deeper structures. Then, as a result of slight traumatism or even without injury, the centre of the area breaks down and an ulcer develops. It may be circular or irregular in shape; it may be quite deep or superficial. The edges are sharply cut, and both base and edges are tightly bound down to the deeper tissues. The intense pain characteristic of these ulcers is supposed to be due to pressure upon the terminal nerve filaments in the dense sclerotic tissue. This form of ulcer is often very difficult to cure, and shows a tendency to return after healing.

Varicose Ulcer.—To chronic ulcer of the leg associated with varicose veins, especially of the smaller venous radicles, the name *varicose ulcer* has been given (Fig. 4826). Such an ulcer occurs most frequently on the lower or middle third of the leg. In shape it is usually irregular, but when it has existed for some time it may become round. The size varies from the small ulcers less than 1 cm. in diameter, formed by the breaking down of an area of periphlebitis around a small vein, to those several inches in diameter. Several ulcers may be present on one limb. The base is irregular, bluish, and pigmented. It may closely overlie an inflamed vein, the rupture of which may cause a severe hemorrhage. The granulations of the base of a varicose ulcer are apt to be weak and flabby. The edges are irregular, undermined, and bluish. Two or more ulcers may become connected by undermining of the skin between them, the skin subsequently melting away so that only one irregular ulcer remains. After a varicose ulcer has existed for a considerable time, the edges may become callous. The discharge is thin, serous, mixed with debris, and may be blood-stained. The skin surrounding a varicose ulcer is often of a brownish-blue color, due to a deposit of pigment. Frequently in a leg in which there are varicose veins, or which is oedematous from other causes, attacks of acute eczema occur. The vitality of the part is lowered by the impaired circulation and by infiltration of the tissues with serum, and as a result of infection of the vesicles, often by scratching, numerous small or large *eczematous ulcers* are formed in an area of hot, red, moist, itching, inflamed skin.

Perforating Ulcer.—This variety of ulcer may occur over the fingers or toes, but is most frequently found on

the sole of the foot over the head of the metatarsal bones, especially the first. They usually occur in men over forty years of age, and are often associated with, and believed by many to be due to, some pathological condition of the nerves or nervous system; either to trophic disturbance, as in locomotor ataxia, or to impaired sensation. Tomaszewski²⁸ believes that they are not always due to impaired sensation and trauma, but that an isolated sclerosis of the plantar arteries plays a part in the etiology. This element might account for their presence in diabetes and late syphilis. A perforating ulcer of the

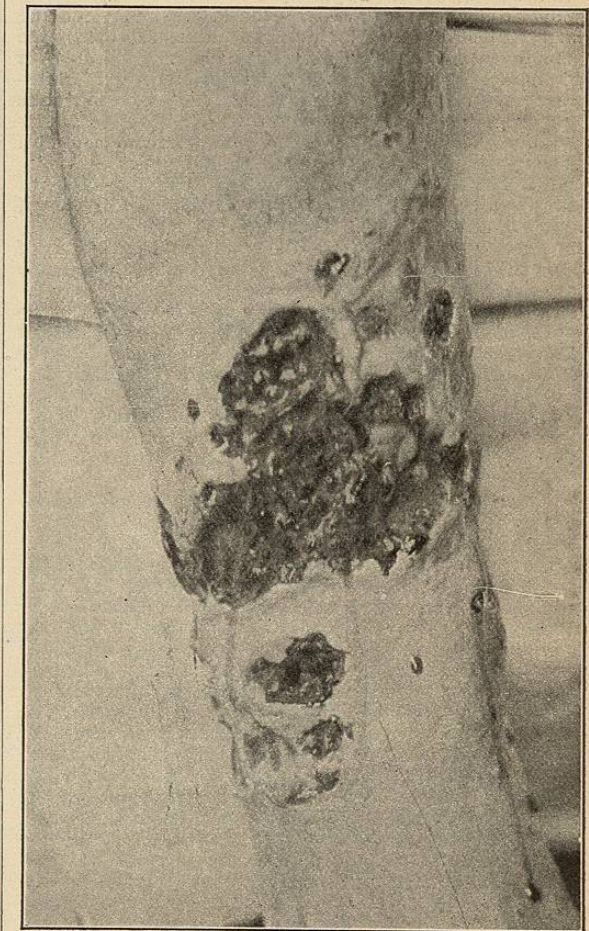


FIG. 4826.—Varicose Ulcer of the Leg, showing Multiple Lesions and Irregularity of Edges and Base.

foot usually begins by the formation of a small abscess beneath a mass of callous skin overlying the head of one or more of the metatarsal bones, the abscess being due to the trauma of walking and pressure. Frequently not much attention is paid to it on account of impaired sensation. Then the bone becomes involved, undergoes a rarifying osteitis, and breaks down. The callous skin over the abscess then sloughs and disappears, and there is left a painless, funnel-shaped ulcer, extending down to the dead bone, which, together with a few reddish, warty granulations, forms the base of the ulcer. When a perforating ulcer has existed for some time, the epithelium grows down the sides, often almost to the bottom, lining the inner surface of the "funnel." This, together with the existence of dead bone at the base, makes these ulcers very hard to heal. The discharge is foul, purulent, and may contain fragments of dead bone.

Gouty Ulcer.—An ulcer may form as a result of the infection and breaking down of gouty tophi. It is usually irregular in shape, and may be elevated. The edges are thin, or, if the ulcer is old, they may be thickened. The base is made up of indolent granulations when the deposit of biurate of soda has been discharged; or, in the fresh ulcer, there may be deposits of sodium biurate in the walls and base of the ulcer. The discharge is a thin purulent serum containing needles of biurate of soda.

Scorbutic Ulcer.—In severe cases of scurvy there is a marked tendency of the skin to ulcerate, not only as a result of breaking down of the subcutaneous indurated swellings which are a symptom of the disease, but also under other circumstances, as when a previously existing sore, a fresh abrasion, or even an old scar becomes the site of a rapidly spreading scorbutic ulcer. Such an ulcer is characterized by a spongy, dark-colored, fetid, adherent crust, the removal of which causes considerable bleeding, leaving a base covered with large livid granulations. The edges are swollen, tumid, and sharply cut. The discharge is a profuse, foul, sanious pus.

Diabetic Ulcer.—Diabetics suffer from a number of skin lesions. They are liable to carbuncles, furuncles, eczema, and acne; and, owing to the poor circulation, lowered vitality, endarteritis, and the circulation of abnormal products in the blood, they sometimes become the subjects of gangrene. Any of these lesions may result in an ulcer. When an ulcer occurs in a diabetic it is apt to be sloughy and to spread rapidly. The skin around it is often red and inflamed, and the ulcer as well as the surrounding tissues may be the seat of a cellulitis.

Tropical Ulcers.—There are several varieties of ulcer which are peculiar to certain parts of the tropics. They usually derive their names from the locality in which they occur. Other tropical ulcers, such as dracuncular ulcer, are named according to etiology.

Penjâel ulcer, also known as Delhi, Lahore, and Kandahar sore and a variety of other names, occurs in India, Central Asia, the Levant, Algeria, and the Malay peninsula. It usually appears on some exposed surface of the body, as one or more papules, which develop into boils and then undergo slow ulceration. The ulcers are usually oval in shape. They may develop rapidly, and several ulcers may merge into one, with a ragged, thickened edge surrounded by an areola of inflammation. The base of the ulcer may be smooth, but is usually uneven, healing at one place and breaking down at another. The ulcer runs a very chronic course, lasting sometimes for months, and is at one time painful, at another not. When it shows a tendency to heal a crust forms, which has to be removed daily to allow healing to occur. It leaves a scar which is depressed, puckered at the centre, and pigmented of a bluish-brown color. According to R. H. Firth,²⁹ although there has been a want of uniformity in the results of the study of the etiology by different observers, we are warranted in saying that there are found in all cases, especially in the epithelial cells, certain coccoid bodies that stand in direct causal relation to the morbid process. Nearly all observers have attributed the Oriental sore to the domestic water supply.

Annam ulcer is a form of phagedena which occurs in Annam, Yemen, Aden, Cochin China, and Mozambique. B. Scheube³⁰ believes that all the cases of this form of phagedena described as occurring in these regions are identical. It usually begins on the foot or leg with an area of infection. This area sloughs and the ulcer grows more or less rapidly, preceded by an area of inflammation. The base is made up of unhealthy granulations, which bleed very easily. The surface is covered with a foul pus or a grayish pseudomembrane. The edges are undermined. The base and edges of the ulcer may be gangrenous to such a depth as to expose to view the underlying tendons and muscular tissue. In some cases the muscle may also be gangrenous. The ulcer is very painful. Syphilis, anæmia, poor general condition, bad hygiene, and poverty, are believed to create a predisposition to the disease. The lesion is very difficult to heal.

Gaboon ulcer, described by Gaucher,³¹ is a form of tropical ulcer found in the natives of Gaboon. It occurs on the limbs and is similar in appearance to syphilitic ulcer, especially in the character of the scar. It is not improved by treatment with antiseptics, but is most amenable to treatment with hot water.

Dracuncular ulcer is endemic in parts of India, Bokhara, Turkestan, Arabia, along the coast of the Red Sea, tropical Africa and parts of tropical South America. The ulcer is due to the filaria medinensis or guinea-worm, a species of thread worm, averaging three feet in length, but which may be as long as six feet. Its habitat is in the subcutaneous tissues. As the worm approaches maturity, she (for only the female is known) works her way toward the surface, usually downward to the leg, foot, or ankle, in order to discharge her eggs. When she reaches the derma, she pierces it and forms a bulla beneath the epidermis. This becomes infected, the skin breaks down and discloses an ulcer with a small hole in the centre, from which part of the worm may project. Usually in about two weeks the worm has emptied her uterus, and can be gradually extracted by gentle intermittent traction. According to Patrick Manson³² the formation of the ulcer can sometimes be avoided by the injection of 1 in 1,000 bichloride of mercury into the tissues as soon as the parasite begins to irritate the skin. This kills the worm and it becomes absorbed like a piece of aseptic catgut.

Veldt sore is a form of ulcer occurring in South Africa. It was common among the British troops campaigning there, especially the cavalry and artillery branches of the service. It is least common in cold weather and high altitudes. Most frequently the sores are found on the exposed surfaces of the body—the hands, forearms, and feet. The etiology is a matter of dispute. Ogston³³ grew an almost pure culture of a peculiar micrococcus, called the micrococcus campaneus, from the serum obtained from the sore. Harmon³⁴ believes the staphylococcus aureus, which has become attenuated in its virulence, to be the cause. Pridmore³⁵ believes the infection to be carried by the horse tick. The sore may begin in the deep layers of the epidermis and assume the form of a bleb, or its first appearance may be that of an abrasion. The ultimate lesion is a slowly extending chronic ulcer, spreading very gradually at its periphery. It is most amenable to treatment by moist antiseptic dressings.

SPECIFIC ULCERS.—*Syphilis, Chancroid.*—The initial lesion of syphilis and the chancroid have both been described in special articles, so we need refer here only to the symptoms and appearance of secondary and tertiary ulcerative syphilitic lesions. These occur on both the skin and the mucous membranes. When a syphilitic ulcer develops on a mucous membrane it assumes one of two types: the superficial and the deep. The superficial ulcer which involves only the mucous membrane has indurated, slightly elevated, sharply cut, perpendicular, "punched-out" edges, and an indurated base covered with a yellowish film of tenacious secretion. These ulcers arise from mucous patches, deposits of round cells, or "mucous gummata." The deep syphilitic ulcers arise from the breaking down of gummata in the deeper part of the mucous membrane or in the tissues beneath it. They are irregular with an indurated, sloughing base, and ragged undermined edges surrounded by an area of induration. The adjacent tissues may become involved in the syphilitic process and undergo destruction. In this way the cartilage of the nose or of the larynx, or the bones of the hard palate or the nose, may be destroyed. After the healing of a syphilitic ulcer there may have been such a destruction of tissues that strictures of the pharynx, larynx, œsophagus, or rectum ensue.

On the skin three distinct types of syphilitic ulcer are found: the superficial, the serpiginous, and the deep. The *superficial ulcer* may appear comparatively early in the disease. It usually varies in size from a quarter to a half dollar; it has a circular outline, with sharply cut edges, and a dirty-yellowish, purulent base. Several of these ulcers may unite to form an ulcerating area with

EXPLANATION OF
PLATE LVII.

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- FIG. 1.—Rodent Ulcer, of Ten Years' Duration. No glandular involvement. (From a case of Dr. W. C. Lusk.)
- FIG. 2.—Carcinomatous Ulcer, Secondary, in Pre-auricular Region.
- FIG. 3.—Syphilitic Ulcer of the Ankle, showing Punched-out Edges and Sloughing Base.
- FIG. 4.—Epitheliomatous Ulcer of the Scrotum, showing Everted Edges and Large Granulations. (From a case of Dr. B. Farquhar Curtis.)
- FIG. 5.—Chronic Traumatic Ulcer of the Leg, showing Irregular Shape, Depressed Base, and Indolent Granulations.
- FIG. 6.—Tuberculous Ulcer, showing Usual Situation, Thin Overhanging Edges, and Exuberant Granulations.

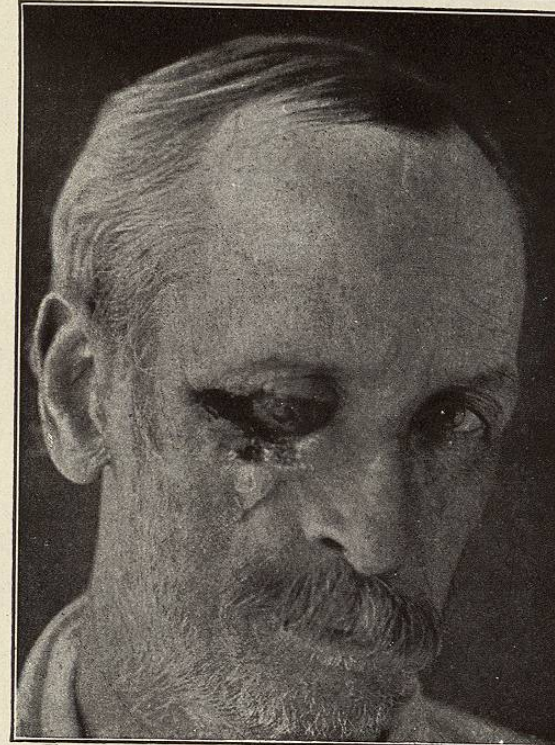


FIG. 1

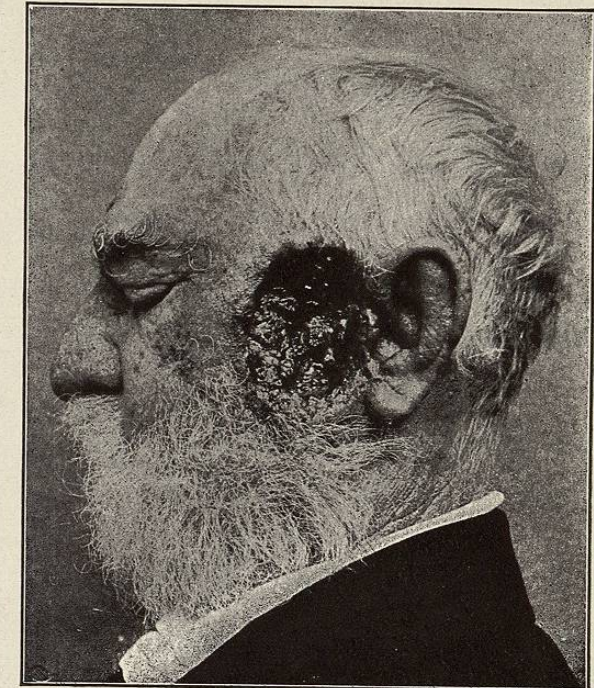


FIG. 2

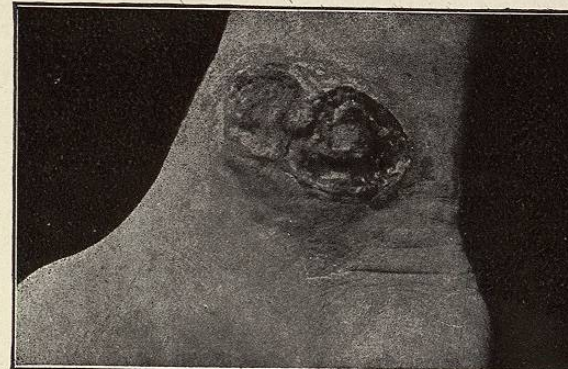


FIG. 3

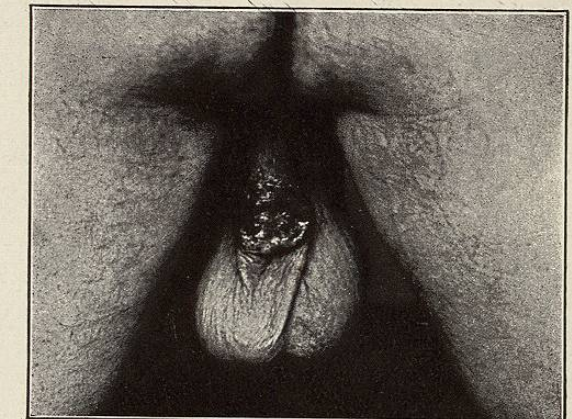


FIG. 4

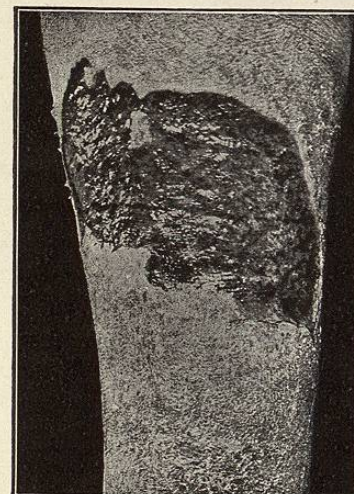


FIG. 5

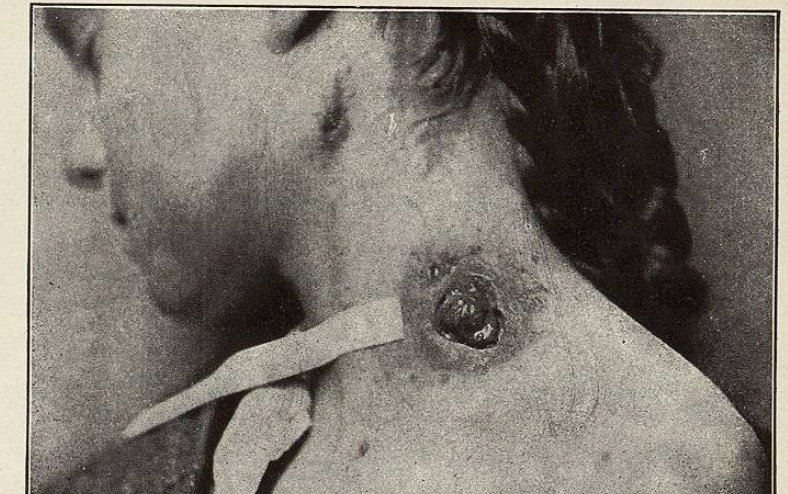


FIG. 6

DIFFERENT VARIETIES OF ULCERS