

70 to 80; sulphate of iron, 20 to 25. This is, perhaps, a fair estimate of their relative value as deodorants.

A solution of *chloride of zinc*, known as "Burnett's fluid," has been largely used in England and Germany as a "disinfectant," and in our own country "Platt's chlorides" and other similar preparations have received the indorsement of many leading physicians for "disinfecting" purposes. There can be no doubt as to the value of solutions of zinc chloride as a deodorant and antiseptic, but, as pointed out in the article *Germicides*, the disinfecting power of this salt has been greatly overestimated. A two-per-cent. solution may be used as a deodorant in the sick-room. It has the advantage of being odorless, and of not staining articles of clothing immersed in it, and is quite cheap. Vallin says: "When a spray of a solution of chloride of zinc is thrown into an infected apartment by means of a spray apparatus, all bad odor is neutralized almost immediately, in less than two minutes. This proves that the salt acts less as a caustic or antiseptic than as an absorbent."

Among the useful deodorants, potassium permanganate deserves to be mentioned. It is more especially applicable as a deodorizing wash for foul ulcers, *ozæna*, fetid feet, etc., and may be freely used in the proportion of 1 to 1,000. Its effect, however, is quite transient, as it is quickly decomposed by contact with organic matter. For this reason it is not available for deodorizing masses of material in privy vaults, etc.

*Caustic lime* is a valuable deodorant as well as a cheap and useful antiseptic and germicide. The use of milk of lime for the disinfection of feces in the sick-room or in latrines is to be recommended, not only because it may be relied upon to destroy the "germs" of cholera, typhoid fever, and other infectious maladies, but also because it neutralizes the bad odors given off from the alvine discharges.

George M. Sternberg.

**DERMATALGIA**, or Dermalgia (Greek, *δέρμα*, skin, and *ἀλγος*, pain), refers to painful sensation in the skin, other than itching, occurring independently of any recognized disease or alteration of structure; it is known also as neuralgia cutis, and is a rare affection.

The sensations in dermatalgia are variously described as of a raw, burning, stinging, and often of a darting, boring character; the suffering therefrom may vary from moderate discomfort to positive agony. The affected skin has all the appearance of health, and remains normal during the existence of the disease, unless altered by outward applications or injury; but the surface of the affected part may be so exquisitely sensitive that the slightest touch causes great distress, although firm, moderate pressure may relieve the painful sensations. The extent of area affected varies, but generally only a small patch is painful, and that may change position; sometimes there are several tender places, and occasionally the entire surface is the seat of more or less cutaneous pain.

**ETIOLOGY.**—The disease occurs mainly in middle life, and is more frequent in females than in males, but is by no means confined to hysterical or nervous individuals. The real cause is often extremely difficult to determine; in many cases it is impossible to fix upon any organic or other lesion which could occasion it. Such instances are often spoken of as idiopathic, but it is quite possible that in some of them careful investigation and advanced knowledge may trace an efficient cause in lesions of the brain or spinal cord, as locomotor ataxia, etc.; in certain cases it appears to be reflected from ovarian or uterine disorder. It has been called rheumatism of the skin, and ascribed to the presence of this poison or to that of uric acid; undoubtedly in a certain number of cases it occurs as a pure neuralgia, in connection with anæmia, chlorosis, malaria, etc.

**DIAGNOSIS.**—This is usually easy to establish, no other condition presenting the features described without skin lesions; when, however, applications to relieve the pain have altered the overlying skin, the diagnosis may be obscured. It is to be remembered that the painful sensations are very superficial, in well-defined areas of the skin

itself, and not deep-seated, as in ordinary neuralgia, muscular rheumatism, etc.

**TREATMENT.**—The general treatment will vary with the case. Anæmic and neurotic subjects must be treated on general principles; the rheumatic or gouty state must be counteracted, if past or present history reveals it; special diseases in females must be remedied, and careful study must be given to trace any condition capable of exciting reflex nerve disorder, such as a loaded colon or rectum, etc. Locally, considerable difficulty may be experienced in obtaining much or permanent benefit. Galvanism affords some relief, and it has been recommended to apply blisters, with morphine, to the part. The surface feels most comfortable when firmly bound with a dressing which prevents all friction, and an ointment of tar and zinc, with belladonna or aconite, spread thickly on lint, will often serve to keep the part free from pain while applied.

L. Duncan Bulkley.

Beau: Arch. gén. de méd., t. xii., Paris, 1841. Duhring: "Diseases of the Skin," p. 577, Phil., 1882.

**DERMATITIS, BLASTOMYCETIC.**—In view of the fact that the recognition of this condition is of relatively recent origin, although the literature is now rapidly increasing, a brief review of the results obtained up to the present time will not be out of place here.

This disease is not only important as a newly described affection of the skin, but is also of value in that it was demonstrated for the first time through the investigation of this disease that blastomycetes were pathogenic in man.

On May 30th, 1894, at a meeting of the American Dermatological Society, the writer showed microscopical sections illustrating a hitherto undescribed disease of the skin. The patient had been treated by Dr. Louis A. Duhring, who, from a clinical standpoint, had regarded the case as a typical example of chronic scrofuloderma. The writer's sections, however, proved conclusively that no form of tuberculosis was present, but that the condition represented one of which no account appeared in the literature. The principal histological features were as follows: (a) A marked benign hypertrophy of the epidermis; (b) the presence, throughout the epidermis and upper part of the corium, of numerous, scattered miliary abscesses, varying in size, some of which communicated with the surface; (c) large numbers of plasma cells present chiefly in the corium but also found in the miliary abscesses; and lastly, (d) formations in the corium slightly suggestive of tubercles. Many giant cells were also present. Furthermore, the writer discovered in the abscesses and also in the corium numerous doubly contoured, highly refractive bodies, which developed by budding and were identified later as blastomycetes. Usually only three or four of these bodies, but in one instance as many as fifteen, were found in a single abscess. They had a diameter of from 10 to 16  $\mu$ , a coarse and finely granulated protoplasm, and were vacuolated. On the addition of liquor potasse to the sections the organism became more refractive and could more easily be detected. The development of budding could easily be followed out in the sections. The author held that the formation of the abscesses was due to the presence and growth of these organisms—an opinion which he subsequently confirmed by later work. No cultures were obtainable.

As a result of his investigations, Gilchrist applied later the term *blastomycetic dermatitis* to this newly discovered condition.

Six weeks after the exhibition of the above-described sections, A. Buschke, at a meeting of the Greifswald Medical Society, held on July 7th, 1894, referred to a case of skin disease in which he had found coccidial bodies. The whole subject, however, was elucidated by Otto Busse, who recognized the case as one of infection by a saccharomyces. A full report by Busse appears in Virchow's *Archiv* under the title of "Saccharomyces hominis."

The patient, a woman, thirty-one years of age, of a distinctly scrofulous diathesis, presented on the left tibia a swelling, which clinically suggested a gumma or a soft

sarcoma. She was very anæmic, and many of her glands were enlarged. Busse found in the tumor a pathogenic yeast-like organism, which he classed as a blastomycetes. The disease gradually advanced and roundish ulcerations, with swollen edges, which gradually became confluent, appeared on the face. The same organism was obtained from these ulcers. Other lesions and swellings appeared in various parts of the body, and the patient died of exhaustion. At autopsy nodules were found in the spleen and left lung, abscesses in both kidneys, and a tumor, the size of an egg, in the apex of the right lung. Large numbers of blastomycetes were present in all the lesions. In cultures, they developed as a whitish growth and caused fermentation in grape-sugar bouillon.

By inoculation local abscesses were reproduced in dogs, mice, and rabbits. One rabbit, however, died on the third day, and in the case of white mice, which were killed, the organisms were found in the blood. The blastomycetes measured from 7 to 14  $\mu$  in diameter, they were doubly contoured, very refractive, and were found both within and outside of cells.

Busse regarded his case as one of chronic pyæmia, in which there occurred purulent destruction of portions of the skin, knee-joint, kidneys, spleen, and lungs.

A case somewhat similar to Busse's was recorded by M. F. Curtis in France, and he compared the tumor-like growth which occurred in a man to myxomatous tumors. He was able to prove that the lesions were due to a pathogenic blastomycetes.

The first case of a purely localized blastomycetic dermatitis which was investigated from a cultural and experimental, as well as from a clinical and histological standpoint, is that published by Gilchrist and Stokes (July, 1896, and January, 1898). The patient, a slender but wiry man, thirty-three years of age, had suffered from a peculiar skin disease for over eleven years. The lesion began as a small "pimple," which was situated on the neck behind the left ear, and soon became pustular. It spread forward gradually and finally involved about two-thirds of the face. It always showed a tendency to heal spontaneously, leaving behind at first an hypertrophic and later on an atrophic scar. (The accompanying photograph shows the extent of the lesion and the condition present, when the patient was first seen by the authors.) A second similar lesion appeared one month after the primary invasion, on the back of the right hand. This healed at the end of four years, caustics having been used. Six months after the appearance of the first lesion, the patient noticed a third, on the right side of the scrotum. This gradually increased in size for a year and then healed spontaneously. A fourth lesion appeared on the left thigh, and a fifth on the back of the neck, both being probably due to auto-inoculation. They grew slowly for a year and then healed spontaneously. The lesion on the face, which had been diagnosed as an unusual example of lupus vulgaris, presented the following features: The

whole diseased patch had a well-defined margin; the upper border, which extended transversely over the forehead, consisted of a relatively narrow inflammatory zone of red superficial ulceration, covered by a scanty scab. Along the right eyebrow it presented a firm papillomatous appearance. These papillomatous growths could be separated, and sometimes a minute quantity of pus could be squeezed out from between them. These lesions were partially covered by thin scabs. The right border of the diseased patch measured about 2.5 mm. in breadth; it

presented, more particularly in its lower portion, a markedly papillomatous character, being dry and scaly. The papillæ were all closely aggregated, the largest being of the size of large pinheads. The lower border presented a superficial ulcerative margin similar to that in the upper border, except at the lower angle on the left side of the face, where it was again markedly papillomatous. The whole area enclosed by this irregular border consisted of one continuous atrophic scar, which was whiter and less dense than the normal skin. The eyelids on both sides were practically destroyed, so that the patient could not cover the eyeballs. Around the left eye the patch presented a raw, red surface, which was moist and bled easily. The tears were continually running over the lesions. The patient said that the disease was not particularly painful. The general health was good; there was no cough and no enlarged glands were noted. There was no history of syphilis or of tuberculosis.



FIG. 1589.—Blastomycetic Dermatitis. (Gilchrist and Stokes.)

In arriving at the diagnosis, the authors emphasized the fact that each lesion began as a papule, which soon became pustular; later, superficial ulceration or markedly papillomatous lesions were noted. Again, they pointed out that in this case there was an entire absence of the nodules so characteristic of lupus vulgaris, and that papillomatous lesions, although they are sometimes met with in lupus, are never found on the face in such cases.

Sections from the cutaneous lesions showed budding vegetable organisms, somewhat resembling yeast bodies, which were proven to be blastomycetes. The other pathological findings were similar to those described by the writer in his first case, viz.: marked epithelial hypertrophy, numerous miliary abscesses scattered throughout the epidermis and corium, large numbers of plasma cells, and in many sections almost typical tubercles in the corium. (A drawing of a microscopical section and numerous blastomycetes found in sections, as well as a micro-photograph of an epidermal miliary abscess, are represented in Figs. 1590 and 1591.)

The organisms in the tissues were mostly spherical, unicellular bodies, having a diameter of from 10 to 20  $\mu$ ; they consisted of a doubly contoured membrane enclosing a coarse and finely granular protoplasm with an occasional vacuole. Many budding forms in various stages were found, but no nucleus could be demonstrated and neither mycelium nor hyphæ could be found in the

tissues. For the most part the parasites were extracellular, although a few were enclosed in giant cells. The organism was obtained, in pure culture, from two parts

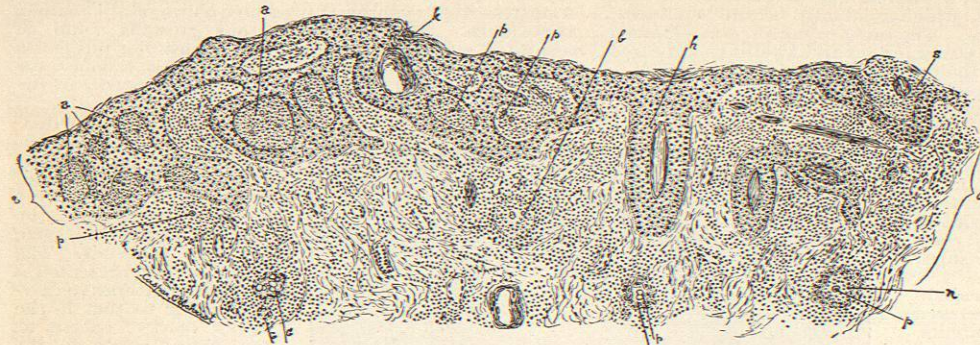


FIG. 1500.—Represents a Microscopic Section of Blastomycetic Dermatitis, showing hypertrophied epidermis (e), numerous miliary abscesses (a) which contain parasitic organisms (p). In the corium (c) are pseudo-tubercles (n) with giant cells (G) and parasites (p). (Original.)

of the cutaneous lesions, from the pus squeezed out from between the papillomatous areas. The organism grew on all the ordinary media, but especially well on potato and beerwort agar. The cultures showed budding forms and also a fairly profuse mycelium. Older cultures, carried through many generations, consisted chiefly of mycelium. The organisms in the cultures were roundish or ovoid, doubly contoured, refractive bodies, varying from 10 to 20  $\mu$  in diameter. Dogs, a horse, a sheep, and guinea-pigs were successfully inoculated, the most striking features being nodules microscopically simulating tumors and pseudo-tubercles in the lungs. The organism was also a pus-producer. This case was identified as a second instance of *blastomycetic dermatitis*, similar to the one reported by the writer in 1894, and the organism was termed *blastomyces dermatitidis* by the authors.

A. Buschke, to whom reference has already been made, has lately done some excellent work upon this subject. He described in minute detail the changes noted in Busse's case, and also reproduced the lesion experimentally upon the patient. On the forehead there was a roundish, sharply indented ulcer, the size of a lentil, which showed a raised edge, only slightly infiltrated, but somewhat undermined, and a livid areola. The base of the ulcer was flat, granular, and covered with a tenacious, reddish-gray secretion. Near by were acne-like nodules, about as large as hemp seeds. Round the hairy part of the neck were four or five small acneiform ulcers. While the patient was under observation the ulcers gradually increased in size, but some of them healed. More ulcers of a similar character appeared upon the face, and a new tumor grew near the elbow-joint, which, however, broke down and formed an ulcer.

The skin disease was partly chronic, partly subacute. The primary lesion resembled an acne infiltration, which broke down at the summit and formed crateriform ulcers with undermined edges and livid areolae. Buschke found blastomycetes in the skin lesions and also in the patient's blood eight weeks before death. The organisms were also cultivated from the ulcers. In describing the histological features Buschke says that the blastomycetes had entered the skin from without and then set up an inflammation, which had led to a melting away and complete destruction, in the course of which were formed giant cells while beyond them there was formed a marked proliferation of fixed connective-tissue cells. The epidermis was affected secondarily, being in parts hypertrophied and in parts destroyed.

The skin of the patient was inoculated with some of the blastomycetes, and on the fifth day there appeared

acne-like nodules; the summits of these soon became necrotic and crateriform ulcers resulted. Blastomycetes alone were found in the secretion, no other bacteria being present.

One ulcer arising from an inoculation into the arm healed in ten days.

Since the publication of these four cases fifteen others have been reported, all from this country, and eleven of them occurred in Chicago, the others being widely distributed. Most important contributions have been made to the subject by Hyde, Hektoen, and Montgomery.

Here it is only possible to refer briefly to these fifteen cases and to say that all were characterized by a marked similarity as regards the onset of the disease, the clinical appearances, the histologico-pathological features, and the morphology of the organism.

To summarize briefly, then, *blastomycetic dermatitis*, or *blastomycosis*, is a disease of the skin occurring in adults

of between thirty and sixty years of age. The lesion begins as a papule or a nodule which usually becomes pustular and then breaks down with the formation of an ulcer. After the ulcer has reached a fair size, it usually presents (in eighteen out of nineteen cases reported) a papillomatous or verruciform appearance, which is especially marked and may be of a fungoid character in very chronic lesions. In many cases, in which the patches were extensive and were situated upon the extremities, the lesions were markedly elevated, in one case forming a cauliflower-like mass an inch in height. The ulcers not infrequently had a foul odor. There was usually a thin mucoid discharge; scabs would form, be thrown off, and replaced by others. The lesions were always somewhat superficial, involving only the skin.

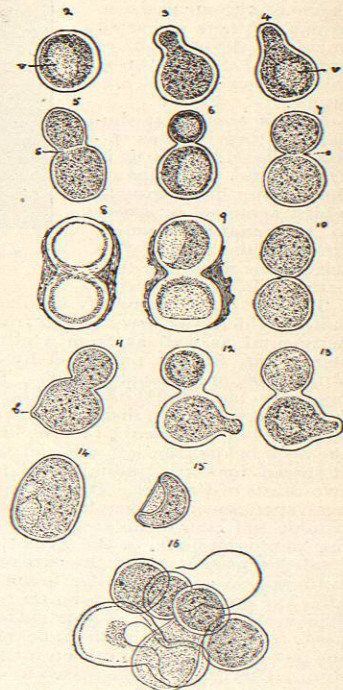


FIG. 1501.—Represents Some of the Individual Blastomycetes Found in Sections like that Shown in Fig. 1500. Nos. 2-16 represent various budding forms; Nos. 8 and 9 show blastomycetes with some form of fibrous coating. (Original.)

The papillae are about the size of pinheads; they can always be separated, and pus can be squeezed out from between them.

In the very chronic lesions there is always some attempt at spontaneous healing, usually with the formation of atrophic scars. In many cases the ordinary pus organisms are also found in the lesions, but examination of the pus squeezed out from between the papillae readily

The diseased patch always has a well-defined, raised edge and is slightly infiltrated. The clinical appearance has generally been suggestive of tuberculosis, usually of the papillomatous or verruciform variety. Dyer's case, however, reminded the observer of the yaws. The Gilchrist-Stokes case simulated lupus vulgaris.

The disease is auto-inoculable, and more than one lesion is usually present. The organisms in all the cases except

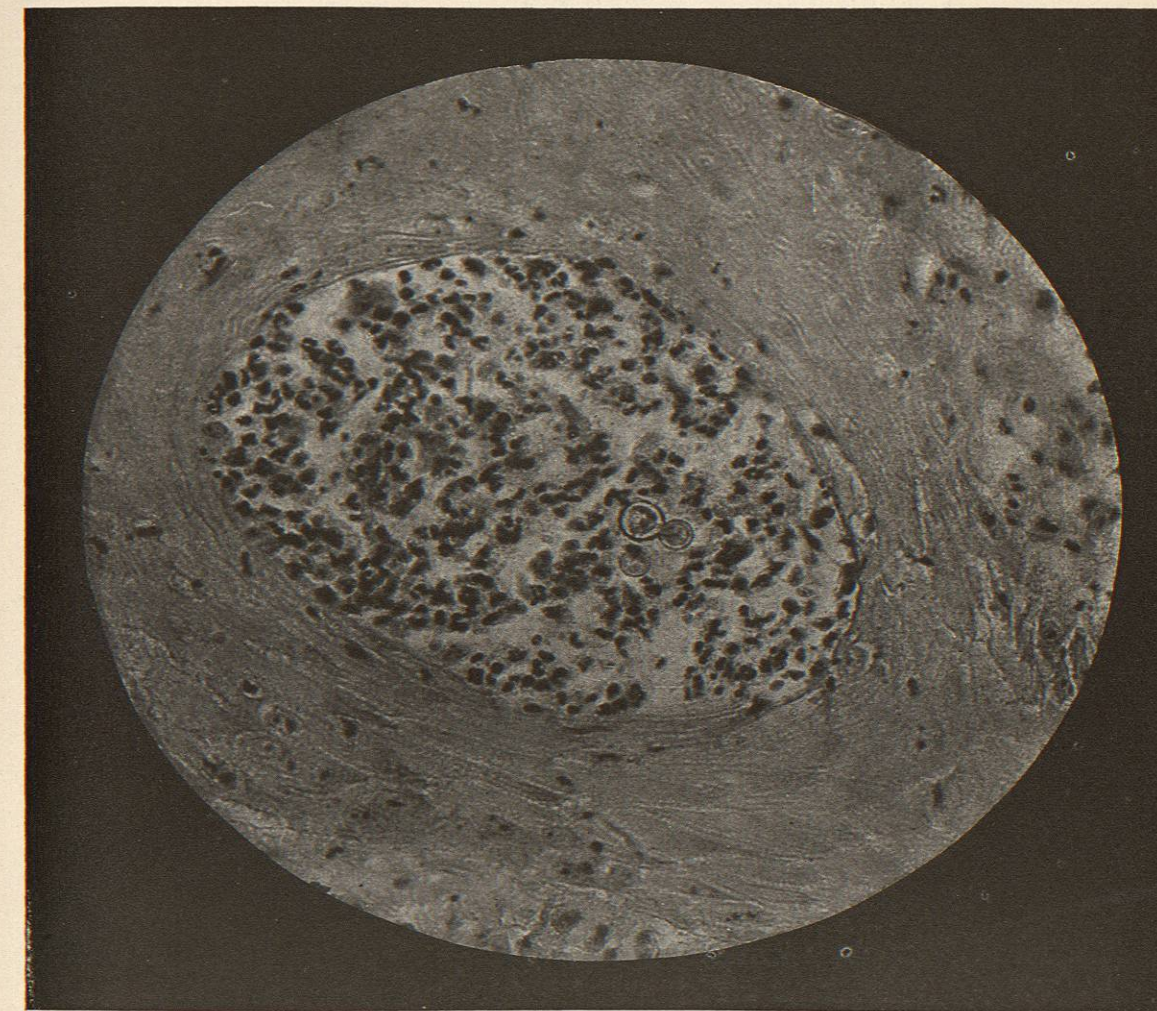


FIG. 1502.—Photo-micrograph from the First Case of Blastomycetic Dermatitis. (Gilchrist.) It shows one of the smaller miliary abscesses contained in the epidermis. Enclosed in the abscess are two blastomycetes, one of which belongs to the large budding variety (seen a little to the right of the centre of the field), whereas the other is a younger detached form which is seen directly below the former. These bodies are similar to those represented in Fig. 1501.

shows the presence of the doubly contoured, refractive, budding bodies—the blastomycetes. The organisms are well brought out by the addition of liquor potasse to the pus. In many cases there is no mixed infection, cultures from the pus giving a pure growth of the organism. Hektoen has shown in cases of mixed infection that if a weak solution of potassium iodide be added to the media a pure culture of the blastomycetes will be obtained, the ordinary pus organisms having been killed.

one (Hessler's) were very similar. They averaged about 12  $\mu$  in diameter, although occasionally they reached 30  $\mu$  in the fresh pus (Buschke). In the sections the organism was doubly contoured, stained fairly well, had a fine or coarsely granulated protoplasm, usually presenting a vacuole. Except in one doubtful instance no nucleus could be detected. The histological features were similar in all the cases. The epidermis presented a marked hypertrophy, sometimes so pronounced that

