

induced, was associated in nine of the cases, and was absent in the remaining five. In some of the cases nerve abnormalities were noted, but in the vast majority no such observations were made, possibly because of technical omissions, in this special direction. Verneuil, for example, reports a dissecting-room case of myomata cutis in which nerve-fibers were present in such abundance that the diagnosis of neuroma could be entertained almost as well as that of myoma.

The diagnosis of myoma must be considered well taken if there has been a preponderating proliferation of well-defined involuntary muscular fiber; but this in and of itself fails to explain why slightly less than two-thirds of the cases present clinical characteristics in the form of severe paroxysmal pain, spontaneous or easily induced in character, whereas slightly more than a third of the cases are free from all special symptoms. It also fails to explain why some of the cases show an abnormal proliferation of nerve elements, and others no special change. The explanation that the pain is due to mechanical pressure of the growth on the surrounding nerve endings, scarcely suffices; otherwise all growths in the cutis would give rise to similar symptoms.

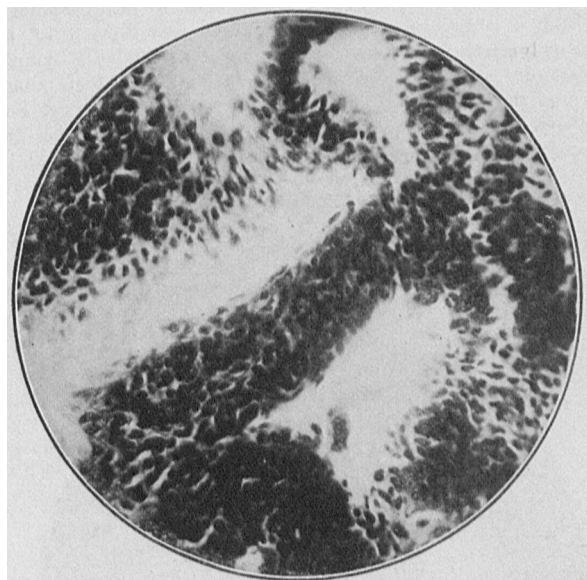


Fig. 4.—General structure of growth under strong magnification. Small, irregularly round, deeply stained cells with large nuclei surrounding lymph-spaces and vascular spaces.

The pathologic proliferation of involuntary muscular fiber in the true skin is unquestionably noteworthy. I am of the opinion, however, that it is not an incident of very exceptional character. I have observed, for instance, marked proliferation of involuntary arrectores pilorum in some of the chronic dermatoses which are attended with persistent creepy and chilly sensations, notably pityriasis rubra pilaris. It is evident that this tissue can readily undergo a very material compensatory hypertrophy under abnormal stimulation, and its hypertrophic presence can readily be considered an effect rather than a cause. If this is true, no cutaneous abnormality would, in all probability, be more conducive to involuntary muscular fiber proliferation than a neuroma, with its attendant intolerant paroxysmal attacks. It is therefore obvious that some of the cases of myomas can, on clinical as well as on pathologic grounds, be considered to be neuromas rather than myomas. Unassociated myoma in my case can probably be attributed to apparent primary absence of all specialized structures, hair, follicles, glands, etc., as well as involuntary

muscular fiber. At all events, all excessively, persistently painful lesions of the skin, in which the pain is of a severe, lancinating, spontaneously paroxysmal or easily induced character, warrant a careful technical examination of nerve fibers, and their abnormal presence justifies, in my opinion, irrespective of other findings, the diagnosis of neuroma cutis. The cases doubtless justify further differentiation, in the form of neuromyoma, neuro-endothelioma or neurolymphangioma, in conformity to the preponderating hypertrophy of the associated pathologic tissue.

CONCLUSIONS

Neuroma cutis is a well-defined clinical and pathologic entity. Its relative infrequency is more illusive than real. Its failure to receive proper recognition and enumeration is doubtless due in large measure to technical omissions. There are good grounds for believing that well-defined cases of neuroma have been accorded classification with other affections of the skin. Every chronic lesion of the skin attended with severe paroxysmal pain, of spontaneous or easily induced type, should be carefully examined for nerve abnormalities and accorded recognition in conformity to the clinical and histologic findings, irrespective of other pathologic changes.

19 West Seventh Street.

THE NEWER CUTANEOUS MYCOSES *

ERNEST DWIGHT CHIPMAN, M.D.

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The investigation of various fungi, called by French writers *les champignons parasites*, offers one of the most inviting fields of medical research. The rapid increase in the number of cutaneous lesions traced to fungous origin inevitably brings the dermatologist face to face with problems in mycology which clinicians have been accustomed to relegate to the botanist. While the science of bacteriology has developed rapidly as a branch belonging particularly to medicine, the study of true fungi has been generally considered as something of merely academic interest. Medical mycology has been lagging behind. Our schools give it scant notice and American literature deals with it only to the extent of detached case reports. So sparse, in fact, is our literature on the general subject of pathogenic fungi that I could not find a single complete description of the common thrush organism in more than a score of American text-books consulted for the purpose. It seems certain that if our knowledge of mycology is to progress as it deserves it must be through the same cooperation of clinician and laboratory worker that has made possible the notable advance in bacteriology.

Of course all bacteria are fungi though of a special order, differing from the so-called true fungi in their direct reproduction by fission; but there has always been a tendency to separate the true fungous diseases from those caused by bacteria. Recently, however, such striking resemblances have been shown as to make the distinction seem wholly artificial. Many diseases due to fungi closely simulate bacterial diseases. The mode of action of pathogenic fungi is identical with that of bacteria, namely, by toxins, which has been shown by numerous observers. Serologic reactions have been

* Read in the Section on Dermatology of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

found in fungous diseases quite comparable to those of bacterial infections. Likewise facts relating to immunity in mycoses have been shown to be exactly analogous to those of bacterial disease. These are reasons for bringing the two classes of organisms into closer union rather than considering them as opposites.

The purpose of this paper is to emphasize the need for a wider knowledge of the pathogenic fungi as well as to recapitulate some of the available facts concerning the more recently described mycoses with which dermatologists may have to deal.

For even a brief survey of these conditions some preliminary consideration must be given the general classification of fungi in order to appreciate their relationship to one another. This question may be approached from several distinct points of view. The purely botanic classification would seem most precise in that it arranges various units into groups or families based on genealogic affinities. The classification on a simple morphologic basis, as the grouping of bacteria under such titles as bacilli, cocci, etc., will not suffice. The division of fungi into groups according to the pathologic processes they cause may be of practical value to the clinician. Bodin,¹ first arranging fungi as far as possible in groups according to their relationship, would thereafter adopt an admittedly artificial classification according as the lesions they cause in man are strictly cutaneous or capable of becoming generalized within the body.

Up to a certain point our classification must rest on a sheer botanic basis. The exact place of fungi in the plant world is seen by constructing a table beginning with the thallophyta, which differ from the other fundamental forms of plant life in that they show no differentiation into distinct parts as root, stem and leaf.

The group of thallophyta presents three subgroups:

1. Schizophyta, or fission plants.
 - (a) Schizophyceae: chlorophyll present.
 - (b) Schizomycetes or bacteria: chlorophyll absent.
2. Algae.
3. Fungi.

Fungi are divided into two subgroups:

1. Myxomycetes: devoid of sheath and parasitic only to vegetable life.
2. Eumycetes: having a cellulose sheath and parasitic to man and animal.

Eumycetes, then, are the fungi with which we are concerned in this discussion. They are divided according to their modes of reproduction into four groups:

1. Oomycetes: egg-producers.
2. Ascomycetes: fruiting by asci.
3. Basidiomycetes: forming basidia.
4. *Fungi imperfecti*: mode of reproduction yet unknown.

Fungi imperfecti constitute a much-discussed group in mycology. One view is that they are fungi which were formerly superior or perfect but which have become inferior or imperfect. In other words, they have lost their superior form of reproduction, the ascus, and have retained their lower form, the conidium. Another conception is that they are primitive forms which are offshoots of other fungi of more complicated forms.

It will be noted that this classification makes no mention of the terms "yeasts" and "molds." In a general sense fungi which reproduce by budding are called yeasts, while those which fructify by spore-formation are termed molds.

The true yeasts are fungi that reproduce vegetatively by budding and that form ascospores under certain con-

ditions. Some fungi that morphologically are yeasts and reproduce by budding do not form ascospores. Some also resembling yeasts morphologically produce disease, and their exact botanic position is uncertain. They are termed "pseudoyeasts," "torulae" or "mycodermae," and are grouped among the *fungi imperfecti*.

While the yeasts are unicellular the molds are multicellular. It is difficult to define molds. The systematic botanist does not recognize any such group. Considered collectively, however, they present certain superficial resemblances. They all possess a plant body made up of hyphae. They do not form a specific class of fungi, for they include members of each of the four chief groups of fungi. The term "hyphomycetes" is often used to cover this group.

Under the title of newer cutaneous mycoses may be included those skin diseases the specific fungus of which is of relatively recent discovery. Some of these, as is well known, are not limited to the skin but become more or less generalized. It is not within the scope of this paper to discuss all of these dermatomycoses exhaustively. The intention is rather to mention certain aspects of each with the view of emphasizing the importance of their recognition.

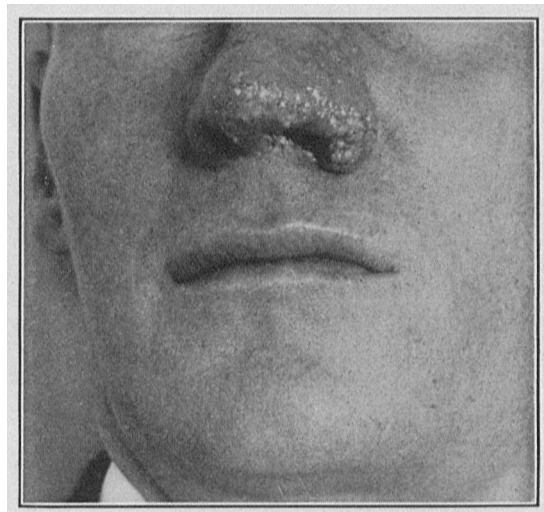


Fig. 1.—Granuloma coccidioides.

The diseases selected for special mention are trichomycosis of Castellani, blastomycetic dermatitis, granuloma coccidioides, sporotrichosis, oidiomycosis and hemisporosis. New light recently shed on the subject of eczema marginatum and the group including actinomycosis, mycetoma, etc., brings these affections also within the range of this discussion.

Trichomycosis is the name applied by Castellani to an affection of the hair of the axilla which he has often observed in the hot, damp districts of Ceylon. The disease consists of soft formations, yellow, black or red, and easily removed by scraping with a triangular needle or similar instrument. The yellow variety is due to a bacillus-like fungus, probably a streptothrix or one of the microsporoides. The pigmentation in the black and red varieties is caused by coccus-like organisms which grow in symbiosis with the streptothrix-like fungus.

What was described in 1860 by Hebra as eczema marginatum was subsequently considered of parasitic nature and was called inguinal trichophytosis until Sabouraud in 1907 described the parasite as an epidermophyton and showed it to be entirely distinct from the trichophytons. The clinical aspects are well known. The

1. Bodin: Les champignons parasites de l'homme.

sharp outline with somewhat elevated border and the tendency to central resolution with peripheral extension give it the trichophytoid appearance which accounts for the earlier mistake concerning its cause.

Aside from the common type, Sabouraud describes two others which are rare. The non-circumscribed erythematous type is red throughout, though in its later stages showing a tendency to heal in the center. The eczematoid type, however, observed in only one case of a considerable epidemic, showed a marked inflammatory aspect and an elevation of the entire lesion. This type was regarded as corresponding to the compound of eczema and trichophytosis described by English authors.

In 1910 Sabouraud² recognized in certain so-called eczemas of the fingers and toes other lesions due to the same organism. What would now appear to be the appropriate name for the condition is epidermophytosis with the proper adjective to denote the region involved if such qualification is deemed necessary.

The discovery of a specific organism capable of evoking a reaction which passes for an eczema is an event of importance. The question of micro-organisms in eczema, whether primary or secondary, whether fungous or bacterial, is probably by no means definitely settled.

The differential diagnosis of interdigital epidermophytosis and true eczema is made by the exclusive local-

forms is of comparatively recent date. Sporotrichosis was first described by Schenck,³ and Hektoen and Perkins,⁴ in 1898 and 1900, respectively. The two cases were considered identical and the organism was named sporothrix of Schenck. Matruchot and Ramond, without knowing of these cases, described a variety cultivated in Paris by de Beurmann and Ramond, and named it *Sporotrichium beurmanni*.

De Beurmann and Gougerot compared these two parasites in 1906 on the basis of the text of American descriptions and the accompanying illustrations, as well as specimens which Hektoen had sent them as typical of the sporothrix of Schenck. Between these two organisms they found differences in development, cultural appearances and biologic characters, differences sufficiently marked to justify considering them as distinct. In the years 1909 and 1910 quite a series of new cases was reported in the United States by various authors. In all accounts the parasite was called the sporothrix of Schenck.

Shortly before the publication of their book on Sporotrichosis in 1912, de Beurmann and Gougerot⁵ had the opportunity of comparing cultures of recent American cases taken to them by Davis with those of the *Sporotrichium beurmanni*. As a result of this comparison they concluded that the Davis cultures are, if not identical with those of de Beurmann, at least the connecting links between the *Sporothrix schenckii* first sent to them from the early American cases and the *Sporotrichium beurmanni*.

They consider that in the circumstances three interpretations are possible:

1. The first American specimens of the *Sporothrix schenckii* represent the true type of this organism, in which case the *S. schenckii* and *S. beurmanni* are closely related but different organisms.

2. The *S. schenckii* and the *S. beurmanni* are derived from a common stock but differ to-day though related by numerous intermediaries as the specimens of Hyde and Davis.⁶

3. The original specimens of *S. schenckii* sent to de Beurmann represent a fixed and irreducible pleomorphism of the *S. schenckii*, differing from the original Schenck and the original Hektoen cultures. The *S. schenckii* is not to be judged by the first specimens. The true *S. schenckii* is represented by the Hyde-Davis type. In this case, since the de Beurmann form is practically like the Hyde-Davis form, the *S. schenckii* and the *S. beurmanni* are identical.

The practical importance of this question lies in the fact that cultural appearances play an important part in the recognition of sporotrichosis. A point much to be emphasized is the necessity of using a standard medium. On the so-called *milieu d'épreuve* of Sabouraud the sporothrix gives a definite appearance. One who gets his impressions of cultural appearances from de Beurmann and Gougerot's description would not recognize the cultures of early American cases as growths of the same organism, the one being nearly black while the other is nearly white.

Microscopically the differences are not marked between the two forms, though the short oblong forms seen in



Fig. 2.—Blastomycetis dermatitis (courtesy of Dr. E. C. Dickson).

ization in the interdigital spaces, the callous inferior border of the lesion, the fine vesiculation of the adjacent skin, the absence of eczematous patches elsewhere, and the presence or antecedent history of inguinal epidermophytosis.

Cultures of the epidermophyton are made with some difficulty. The cold culture on glucose, gelatin-peptone gives a yellow growth in three weeks.

In connection with the treatment of the affection with an ointment containing 1 per cent. of chrysarobin, Sabouraud emphasizes two pertinent facts relative to the use of this drug. The first is that chrysarobin is soluble in neither petrolatum nor lanolin, though it does dissolve in lard. He therefore prescribes it in lard with directions that it be prepared hot and stirred until cool. The other point is to avoid soap in removing chrysarobin, as the action of an alkali is to increase its penetration. The removal of chrysarobin ointment, therefore, should be effected by the use of oil or lard.

The subject of sporotrichosis brings up the question of identity among several organisms. The importance of the disease makes it worth our while to review briefly certain points in its history.

Many saprophytic forms of sporotrichium have been known for a long time. The discovery of pathogenic

2. Sabouraud: Les Teignes; Sur l'existence fréquente d'un sol-disant eczéma des doigts et des orteils, dû à l'epidermophyton inguinale, Ann. de dermat. et de syph., June, 1910.

3. Schenck: Refractory Subcutaneous Abscesses Caused by a Fungus Possibly Related to the Sporotrichia, Bull. Johns Hopkins Hosp., 1898, p. 281.

4. Hektoen and Perkins: Refractory Subcutaneous Abscess Caused by Sporothrix schenckii, Jour. Exper. Med., 1900, p. 77.

5. De Beurmann and Gougerot: Les nouvelles mycoses; les sporotrichoses.

6. Hyde and Davis: Sporotrichosis in Man, Jour. Cutan. Dis., July, 1910.

specimens made directly from secretions are to be considered as short mycelial forms rather than spores as some have described them.

Other pathogenic forms of sporotrichium have been reported, notably *Sporotrichium dori*, 1906; *S. gougeroti*, 1907; *S. asteroides* (Splendore), 1908; *S. indicum* (Castellani), 1908, and *S. jeanselmi*, 1910.

All of these are apparently in very close relation with the *S. schenckii* except the *S. dori*, which seems to show marked differences both clinically and in culture. The sole case of this form was reported by Dor in 1906. No parasite was demonstrated in smears, but cultures showed fine mycelium which branched dichotomously, as well as zooglia masses from which filaments radiated. These zooglia masses seemed to Dor to be made up of fragments of mycelium rather than spores. Cultures grew rapidly. The colonies reached their height in three days, remained isolated, were dull grayish, without aureole and scarcely elevated at all. At the end of a month they assumed a brownish tint but never became black in any portion. Clinically this one case was evidenced by large, multiple abscesses and was termed subacute. Guinea-pigs and rabbits were inoculated both with the secretion and with cultures, negative results being obtained in each instance.

The usual forms of sporotrichosis show either localized or disseminated lesions. It must be remembered that the disease involves lymphatics, mucous membranes, eyes, ears, joints, muscles and viscera as well as the skin. The cutaneous lesions are too well known to bear repetition. Their resemblance to the lesions of syphilis, tuberculosis and glanders makes their recognition of extreme importance.

The occurrence of sporotrichosis in animals has been shown by Hyde and Davis, de Beurmann and Gougerot and others.

In a botanic classification the sporothrix belongs with the *fungi imperfecti*.

Another mycologic subject about which much confusion has gathered is the relation between blastomycetic dermatitis and granuloma coccidioides of California writers. Do they represent different aspects of the same affection varying because of differences in environment, or do they stand for two distinct though related diseases? Should they be separated or classed together?

First of all, what do we mean by blastomyces? There are no less than three distinct views concerning blastomycetes. The first defines them strictly in accordance with etymologic signification, namely, budding fungi or yeasts. According to Vuillemin a blastomycete is any fungus which appears at a given time under the form of budding globules, whatever its relationship and whatever aspects it may reveal at other periods of its existence. Such a view would bring within the category of blastomycetes the organism of blastomycetic dermatitis as well as the yeasts of cancers, of rabies and of variola. The second view limits the term to the saccharomycetes. The third reserves the name for fungi as yet unclassified.

De Beurmann and Gougerot dispose of all the formerly considered blastomycetes by grouping as exascoses the mycoses due to the saccharomycetes, the zymonemata and the endomycetes. Blastomycetes in their scheme represent simply the residue which is not amenable to classification. The zymonemata are so named because they exhibit at the same time both yeast and filamentous forms. In this group they would include both blastomycetic dermatitis and coccidioidal granuloma.

In making these two diseases identical they are simply following the custom of numerous other writers. It is a noteworthy fact, however, that granuloma coccidioides has occurred practically exclusively in California, where about twenty cases have been reported. Those who have followed these cases are, so far as I know, unanimous in the opinion that however close may be the relationship between their respective organisms, there yet remain sufficiently well-marked points of differentiation to make of each one a distinct entity. Clinically, as indicated by Hektoen, the nodules in the California disease bear a closer resemblance to the typical specific tubercle than do the nodules of blastomycetic dermatitis. There is, furthermore, a marked tendency toward the involvement of lymph-nodes in coccidioidal

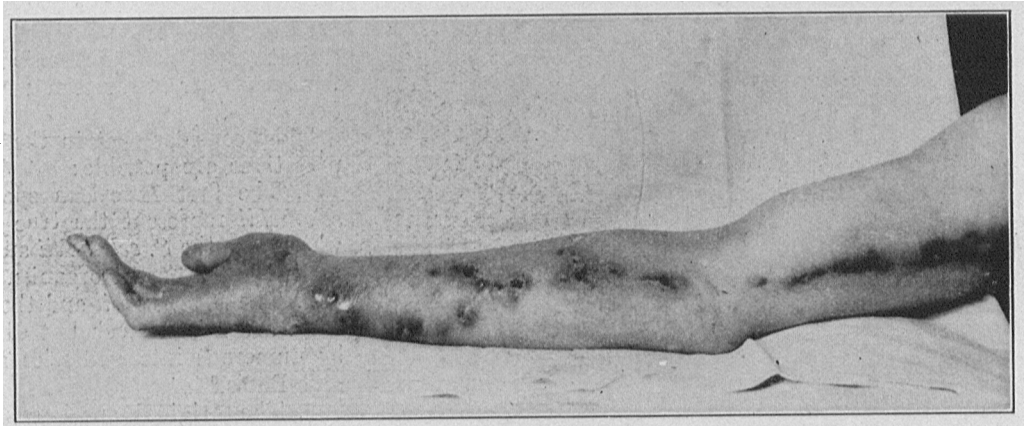


Fig. 3.—Sporotrichosis (Courtesy of Dr. John Armstrong).

granuloma, while in blastomycosis this is slight. Blastomycosis also presents usually its primary focus in the skin with but slight tendency to become generalized, while in coccidioidal granuloma, though the disease may originate in the skin, there is most often generalization.

Microscopic appearances differ, according to Ophüls,⁷ in that the blastomycetes multiplies by budding while the coccidioidal organism multiplies by endogenous sporulation. The latter is moreover a much larger body, attaining a size two or three times that of the blastomycetes. In coccidioidal infection there is an absence of budding forms during its development in the tissues, though these forms are seen in blastomycetic dermatitis. There are also certain differences on artificial culture mediums. A further mark of differentiation sometimes urged is that blastomycetic dermatitis responds to the administration of the iodids, while coccidioidal granuloma resists them. A case of the latter recently under my care tends to deny this point.

This was the case of a man aged 28 who had lived for over two years in the San Joaquin Valley, the district in which most of these cases have originated. By occupation he was a machinist. The family history showed that an aunt on the maternal side had died of

7. Ophüls, W.: Jour. Exper. Med., vi, 443; Coccidioidal Granuloma, THE JOURNAL A. M. A., Oct. 28, 1905, p. 1291.

tuberculosis. The previous cutaneous history was negative. The previous general health had been good except for some cough and loss of weight for several months past. Dr. H. S. Warren of Coalinga, who referred the case, had found tubercle bacilli in the sputum.

The lesion, which began as a pimple on the left side of the nose in August, 1912, had, when I first saw it two months later, attained a size of 3 cm. in diameter, extending to the upper lip. It was circular and elevated above the surrounding skin approximately 5 mm. In color it was violaceous and in consistence boggy. It was apparently made up of an agglomeration of papules. Scattered throughout the surface were numerous minute, superficial pustules. Subjectively it was painful, tender and intolerant of any save the blandest applications. There was no evidence of scar tissue; neither was there any sign of tendency to spontaneous repair. There was no suggestion of any verrucous element. The submaxillary lymph-node on the corresponding side was markedly enlarged.

Smears from the pustules showed doubly contoured cells which I considered blastomycetes. Dr. Ophüls, of whom I sought confirmation, identified them as coccidioidal fungi. Careful examination of the sputum revealed tubercle bacilli but no fungi. The cutaneous lesions as well as the enlarged lymph-node showed marked improvement under the administration of potassium iodid, but what was clinically a laryngeal tuberculosis quickly followed the pulmonary condition and the patient died within a few months of the first observation. Unfortunately a post-mortem was impossible.

Oidiomycosis is a term applied to a fungous disease of which only two cases have been reported: the first by Babès in 1882 as dermatomycosis discoidea exulcerans caused by the *Oidium subtile cutis*, and the second in 1910 by de Beurmann, Gougerot and Vaucher⁸ due to the *Oidium cutaneum*. According to the latter observers the so-called *Oidium albicans* of thrush is not an oidium at all but belongs with the endomycetes; for the name oidiomycosis should be applied only to those affections due to the oidium defined by Linck as showing "ram-pant, septate mycelium of isolated filaments; simple, erect, septate conidiophores dividing into oval or cylindrical chain-like conidia."

The clinical aspect of oidiomycosis is that of an ulcerating gummatous nodule which resembles blastomycetic dermatitis, syphilis or sporotrichosis. The diagnosis is best made from cultures. On Sabouraud's medium, de Beurmann and Gougerot's case showed macroscopically the viscous glistening veil of yeasts. Microscopically they presented exclusively round, budding forms. Biologically they caused fermentation of glucose into alcohol and carbonic dioxid. From the first cultures the observers thought of saccharomyces of Busse-Buschke; later, in subcultures the colonies became god-rooned or fluted, yellowish-white and resistant. Filamentous forms were added to the yeast-cells which suggested blastomycetic dermatitis. Finally subsequent transformations of the same parasite showed it fixed under exclusively filamentous forms, with all the characters of the genus oidium of Linck. Macroscopically the cultures were godrooned and even downy on potato; microscopically the oidium form was without mixture of yeast forms; biologically glucose was no longer attacked.

The *Oidium cutis* of Babès gave ulcerations of the skin of a rabbit and the *Oidium cutaneum*, though slightly virulent, is pathogenic for rats.

8. De Beurmann, Gougerot, H., and Vaucher, R.: Oidiomycose gommeuse ulcéreuse disséminée, Rev. de méd., December, 1910.

The prognosis is good and the disease yields to iodids as sporotrichosis and other mycoses.

The study of the oidium shows an organism exhibiting itself first as a yeast or blastomycetes, then as one of the zymenomata of de Beurmann and Gougerot; that is, an organism showing both yeast and mycelial forms, and finally in the exclusively filamentous forms of the true oidia. It illustrates the transitions possible between the different genera of the same family. According to Gougerot it emphasizes the fact that a yeast form may be only a degraded aspect of a mycelial parasite of the genus oidium, and that the budding yeast aspect is only a non-specific morphologic aspect common to very different parasites.

If the characteristics of the mycelium as set forth by Linck are the sole criteria by which the true oidiomycoses are to be judged, then it would seem as if the organism of granuloma coccidioides was correctly named originally by Ricketts⁹ when he applied to it the designation of *Oidium coccidioides*. In this case granuloma coccidioides would properly belong with the group of oidiomycoses. As we have seen there are similar though distinct forms of sporotrichosis, and also there are marked resemblances between blastomycetic dermatitis and granuloma coccidioides. The same sort of analogy exists between actinomycosis and mycetoma or Madura foot. There has been much discussion as to the relation between the organisms of the two diseases last named, the majority of writers favoring the view that each one has its own special organism, although admitting close relationship. Recent research according to Gougerot shows that these clinical units result from multiple parasites.

Mycetoma, which was first described over two hundred years ago, was first reported in America less than twenty years ago. Sutton has recently reported from Kansas City two cases of this mycosis which makes a total of seven American cases.

Hemisorporosis, due to the *Hemispora stellata*, was first described by Gougerot and Caraven in 1908; the case being a primary osteitis of the tibia simulating syphilitic periostitis or post-typhoid osteomyelitis. Two subsequent cases have been reported, one resembling a tuberculous gumma, the other a syphilitic nodule.

The consideration of the ever-increasing list of mycotic disease leads to the opinion that many new forms are yet to be revealed. Presumably many of the known forms constantly escape recognition.

One who becomes interested in the group will not fail to be struck with the necessity of a clearer classification or even the general adoption of any classification. There seems to me urgent need for dermatologists to undertake more comprehensive work along the line of cutaneous mycology.

The clinical lesson is that any subcutaneous nodule or refractory abscess about whose etiology there is the slightest uncertainty should be subjected to careful investigation to determine the presence or absence of pathogenic fungi. To avoid discrepancies of description, a standard culture-medium should be employed.¹⁰

9. Ricketts, H. T.: Philadelphia Med. Jour., April 27, 1901.
10. In addition to the references already given, the following will be found of interest:

Castellani: Brit. Jour. of Derm., November, 1911.
Brown, Philip King: Coccidioidal Granuloma, THE JOURNAL A. M. A., March 2, 1907, p. 743.
Gougerot: Gaz. des hôp., Jan. 5, 1913.
Hektoen: Systemic Blastomycosis and Coccidioidal Granuloma, THE JOURNAL A. M. A., Sept. 28, 1907, p. 1071.
Montgomery, F. H.: Cutaneous Blastomycosis, THE JOURNAL A. M. A., June 7, 1902, p. 1486.
Sutton: Mycetoma in America, THE JOURNAL A. M. A., May 3, 1913, p. 1339.
Wells: Jour. Med. Research, vol. vii, No. 3.

I wish to express my indebtedness to Dr. Ernst A. Victoris of San Francisco for many slides and cultures used in the preparation of this article. I am further indebted to Dr. E. C. Dickson of the Leland Stanford Junior University for a culture of blastomycosis.

240 Stockton Street.

ABSTRACT OF DISCUSSION

DR. RICHARD L. SUTTON, Kansas City, Mo.: The question of group classification of the various pathogenic fungi is an exceedingly interesting one, but of more theoretic than practical importance. Sporotrichosis is a comparatively common disease in the Middle West. I have seen almost a score of cases and have heard of as many more unreported instances. From the results of a bacteriologic study of the organisms recovered from the lesions in four characteristic examples of the malady, I am forced to confess that I can find no essential differences between the organism originally described by Schenck and Smith and the so-called *Sporotrichium de Beurmannia* of Gougerot. In studying fungi, even more than in studying the ordinary pus organisms, slight cultural and tinctorial differences are frequently noted, just as slightly diverse clinical manifestations usually follow infection from various strains of staphylococci. While these slight differences mean little to the majority of bacteriologists, they may form ample material for theoretical controversy. Consequently, I agree with Page, Frothingham, Lutz and Splendore and other observers that up to the present time the *Sporotrichium schenckii* (including all of the various strains, of course) is the one and only cause of sporotrichosis. The fact that the disease may be local or general, trivial or fatal, means but little from an etiologic point of view. The existence of several clinical types of blastomycosis hardly warrants our separating the organism into forty-seven different varieties and appending to each a different name.

Mycetoma is an exceedingly rare affection in this country. In all the reported cases the infecting organism has been of the yellow variety. A beautiful example of this disease was recently reported by Allison of Texas (*Texas State Jour. Med.*, October, 1912, p. 166), which I unfortunately overlooked in a statistical study of the condition in America published a few weeks ago. The fact that the causative organism apparently possesses an affinity for the tendons and tendon sheaths may account for the frequency with which the foot is attacked and may prove of value from a bacteriologic point of view.

For several years I have been of the opinion that granuloma coccidioides was an aberrant type of blastomycotic infection. Recent studies have shown that environment will account for many slight clinical, pathologic and bacteriologic differences, even in so thoroughly understood a disease as lues (I of course refer to gangosa); consequently, it is difficult for me to forego the opinion.

DR. H. E. MENAGE, New Orleans: In a case at the Charité Hospital in New Orleans about six months ago, we believed that we found an organism identical with that of de Beurmann.

DR. A. RAVOGLI, Cincinnati: In the course of my private and hospital practice I have seen perhaps nine or ten cases of blastomycosis, and at the present time I have under my care two cases of sporotrichosis. I did not make this diagnosis without seeing the parasite under the microscope and getting a culture. My recent cases were of the tuberculoid type. The parasite has peculiar oval spores that make it easily recognized. I regard sporotrichosis as a much more stubborn affection than blastomycosis, as I have seen several patients with the latter recover, which so far I cannot say of sporotrichosis. Potassium iodid does these patients no good. I have obtained my best results from liquor formaldehydi and liquor cresolis compositus, mixed together. The application of this strong solution burns the surface of the patch and produces a necrotic eschar which sloughs off and leaves a clean healing surface. I give potassium iodid in these

cases, but more as a matter of custom than because I think that it helps the patient.

DR. ERNEST DWIGHT CHIPMAN, San Francisco: The point which I should like to add and emphasize is that to us in California there is a distinct difference between blastomycosis and granuloma coccidioides. The latter affection is almost always apt to become generalized and extremely virulent and rapid in its course. Many of these mycotic diseases are grave if unrecognized, and the point is to make an early, thorough and complete bacteriologic examination. The taking of cultures should be insisted on in all doubtful cases. I think we should have a standard culture medium, such as the glucose-gelatin-peptone medium. If we all use a similar standard culture medium, our results will be more apt to be similar.

DR. DAVID LIEBERTHAL, Chicago: Before this discussion is closed, I wish to mention that Petersen of St. Petersburg (*Archiv für Dermatologie*, 1911) calls attention to the fact that the growth of the blastomycetes is inhibited at a temperature of 40 C. He therefore treated blastomycosis of the skin by applying heat of higher degrees and accomplished excellent results.

TURPENTINE POISONING PRODUCING A SCARLATINOID RASH

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As I have been unable to find any mention, in any of the standard books of reference or in the current medical literature, of a rash appearing in turpentine poisoning, the following case is reported:

History.—E. E., a white girl, aged 20, single, a mill operative, applied for treatment in the medical dispensary of the Germantown Hospital, March 31, 1913. She complained of a bright red, itchy rash covering the face, neck, arms, forearms and trunk. No rash was seen below the waist-line.

Family history was negative. The patient had measles at 7 and scarlet fever at 8; the history was otherwise negative. Because the menses did not appear when due, the patient took 25 minims and twenty-four hours later 30 minims of spirits of turpentine. The next day her face began to swell, her body felt hot and itchy and she noticed the rash. The next day, seventy-two hours after the initial dose of turpentine, she applied for treatment.

Examination.—The lungs and abdominal organs presented nothing abnormal. The heart was in a state of slight tachycardia but otherwise normal. There was no enlargement of the lymph-nodes. The face was generally red and swollen, showing marked edema beneath the eyes. There were two small patches of vesicles, one on the forehead between the eyebrows and the other beneath the lower lip. The rash, which resembled that seen in scarlatina, fading on pressure, reappearing and again fading, extended over the face, arms, forearms and trunk (both anteriorly and posteriorly) to the waist-line. There was no fever, but the skin felt warm on palpation. The throat showed no congestion or membrane. The tongue was clean and showed no abnormal redness or prominent papillae.

On questioning, the patient stated that she was passing less urine than normally but that it did not look as though it contained blood. A specimen, obtained the next day, emitted a marked odor resembling that of violets. This specimen was lost, unfortunately, in transit to the laboratory.

April 4, 1913: Two days ago the rash and edema began to disappear, the vesicles drying up. There is seen, on close examination, a very fine desquamation over the entire rash.

April 7: The edema has disappeared. The rash is almost entirely gone. Urine: Normal odor, amber, acid, specific gravity 1.018, a trace of albumin, no sugar, no casts, sodium urate.