hippuric acid after ingestion of known amounts of sodium benzoate in 12 patients with liver disorders after treatment with synthetic vitamin K analogues.

12015 P

Etiological Agents of North and South American Blastomycosis.*

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A granulomatous fungus infection simulating scrofuloderma was described by Gilchrist in 1894. Since the fungus was seen in the diseased tissues as a budding, yeast-like organism, associated with a skin infection, it was called *Blastomyces dermatitidis*[1] and the disease *blastomycosis*. A number of different species of *Blastomyces*[2] and a number of variously named fungi[3] since reported from cases of North American blastomycosis have been shown to be either slight variations of Gilchrist's organism or to be *Coccidioides immitis*,[4, 5] the causative agent of San Joaquin Valley Fever or coccidioidal granuloma.

South American investigators have described a granulomatous fungus infection as pseudococcidioidal granuloma[6] caused by a fungus first confused with *Coccidioides immitis*,[7, 8] later named *Paracoccidioides brasiliensis*.[9] Moore,[10] however, showed that *Paracoccidioides* reproduced in the tissues by multiple-budding, thus in-

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1 Gilchrist, T. C., and Stokes, W. R., *J. Exp. Med.*, 1898, **3**, 53.

2 *a.* Moore, M., *Ann. Missouri Bot. Gard.*, 1933, **20**, 49; *b.* Moore, M., *Ann. Missouri Bot. Gard.*, 1933, **20**, 471; *c.* Moore, M., *Arch. Derm. and Syph.*, 1933, **27**, 49.

3 Castellani, A., and Jacono, I., *J. Trop. Med. and Hyg.*, 1933, **36**, 297.

4 Benham, R. W., *Arch. Derm. and Syph.*, 1934, **30**, 385.

5 Ciferri, R., and Redaelli, P., *Att. dell' Ist. Bot. Univ. di Pavia*, 1935, **6**, 55.

6 Lutz, A., *Brasil-med.*, 1908, **22**, 121, 141.

7 Fonseca, O. da, and Leao, A., *Compt. Rend. Soc. Biol.*, 1928, **98**, 619.

8 Almeida, F. de, *Ann. Fac. Med. Sao Paulo*, 1929, **4**, 91.

9 Almeida, F. de, *Compt. Rend. Soc. Biol.*, 1930, **105**, 315.

10 Moore, M., *Arch. Derm. and Syph.*, 1938, **38**, 163.

dicating its relationship to *Blastomyces,* but retained the name *Paracoccidioides* and placed it in his family Coccidioideaceae in equal rank with *Coccidioides* and *Rhinosporidium.*

Although the stages in the life cycle of *Blastomyces dermatitidis* and *Paracoccidioides brasiliensis* have been studied by numerous investigators,[1-11] and *Paracoccidioides* has been compared with *Coccidioides,* [8-10, 12] no detailed comparative study of the various forms of *B. dermatitidis* and *P. brasiliensis* has been made. In order to establish the identity of the South American fungus the present study was undertaken.

Seven strains‡ of *Blastomyces,* isolated from lesions of North American blastomycosis, and 6 strains‡ of *Paracoccidioides,* isolated from lesions of the South American disease, were compared as to their appearance in tissue, and their growth and microscopic appearance on various artificial culture media both at room and at incubator temperature. *Blastomyces dermatitidis* was seen in the tissues as single-budding, thick-walled, yeast-like organisms. When diseased tissue or pus from blastomycotic lesions was placed on Sabouraud's glucose agar, after varying periods of time at room temperature, the fungus developed into a cottony-mold-like growth. Microscopically this growth was composed of a filamentous, branching, septate mycelium with numerous spores borne sessile or on short pedicles from the hyphae. In old cultures these spores developed into large, thick-walled, variously sculptured chlamydospores. When this cottony mycelium was transplanted to blood, glycerine, Sabouraud's dextrose, beef infusion or beef extract agar and incubated at 37°C, after varying periods of time the resulting growth was smooth and waxy or cerebriform and wrinkled, and lacked the aerial, mycelial growth typical of the cultures maintained at room temperature. Microscopically this growth consisted of yeast-like, budding forms similar to those seen in diseased tissue or pus.

Paracoccidioides brasiliensis was seen in diseased tissues as multiple-budding, thick-walled, yeast-like cells. As in *Blastomyces,* when diseased tissue, obtained from experimental animals, containing this organism was placed on Sabouraud's dextrose agar, after varying periods of time at room temperature, the organism developed slowly, producing either cerebriform cultures similar to *Achorion Schoen-*

[11] Martin, D. S., and Smith, D. T., *Am. Rev. Tuberc.,* 1939, **39**, 275.

[12] Jordan, J. W., and Weidman, F. D., *Arch. Derm. and Syph.,* 1936, **33**, 31.

‡ The list of these strains with detailed information as to their sources will be published in a later paper.

leini or cottony cultures with well-developed aerial hyphae. Microscopically these cultures were composed of a filamentous, branching, septate mycelium with intercalary, lateral and terminal chlamydospores. When this growth was transplanted to blood, Sabouraud's dextrose, beef infusion or beef extract agar and incubated at 37°C, after varying periods of time the fungus converted to a waxy and smooth or cerebriform growth. Microscopically this growth was composed of multiple-budding, yeast-like cells, identical with the forms seen in tissue.

Since these 2 fungi behave in a similar manner in tissues, in cultures at room temperature and in cultures at incubator temperature, it would seem that the differences noted above should be considered of specific rather than of generic importance. It is the writers' opinion, therefore, that only a single genus should represent the several isolations of fungi from North American blastomycosis and the several isolations of fungi from South American blastomycosis. For this reason the new combination, *Blastomyces brasiliensis,* is proposed for the fungi which produce South American blastomycosis. Although *Blastomyces* is not a suitable name for this genus because of the rules of priority in botanical nomenclature, it should be retained for these fungi until some generally accepted name is agreed upon. As only one species causes North American blastomycosis and the various species reported from South American blastomycosis[10, 18] differ only slightly in cultural aspects and morphology, only 2 species need to be considered, namely, *Blastomyces dermatitidis* Gilchrist and Stokes 1898 and *Blastomyces brasiliensis* (Splendore) Conant and Howell, comb. nov.

12016 P

Effect of Injections of Nuclei on "Take" of Implants of a Lymphoma in Mice.

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In these experiments we have attempted to determine whether or not, by the injection of nuclei of liver and of tumor cells, it is pos-

[18] Moore, M., *Rev. biol. hyg.*, 1935, **6**, 148.

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