

Canadian Work on Dermatophyte Fungi

A NUMBER of papers by members of the University of Manitoba form an admirable review of modern knowledge of the dermatophytes, or fungi which produce ringworm and favus diseases of human skin. The general mycologist will find many features of interest in this field of specialist endeavour, and Dr. P. H. Gregory has provided adequate summaries¹.

The outstanding characteristic of a dermatophyte is that it can utilize the highly insoluble sclero-protein *keratin* as a source of energy. This is apparently accomplished by means of a keratolytic enzyme secreted by the organism. Such fungi may be introduced to unkeratinized parts of the body; several have, indeed, been re-isolated from the blood-stream; but they do not seem to be able to parasitize any organ but the skin.

A very high degree of specificity is found. Some species of the genus *Microsporon* produce ringworm of the scalp in children, but not in adults; the lesions disappear naturally at puberty. Certain species parasitize the hands and feet, whilst others attack only the hairy parts of the body. *M. audouini* infects man, but not other animals. This limited pathogenicity cannot be due to chemical differences between the various sources of keratin, for a number of species will attack that substance from all sources—scalp hair from children and adults, pubic hair, human nails, porcupine quills and snake scales—when it is dissociated from living tissues.

The localized fungal infection, known as a 'mycosis', may not be the sole effect of the organism upon the host. 'Mycids' may occur. These are secondary lesions of a non-parasitic nature, but definitely associated with the presence of the fungus in another part of the body. The very great emphasis on the need for keratin as food for the parasitic dermatophytes is rather striking, as they are also saprophytes of a taste sufficiently catholic to include such diverse food substances as tinned oysters, straw, cereal grains and a wide variety of synthetic media. Their characters are also changed in the saprophytic phase, and very numerous forms of organs appear in artificial culture which are unknown in the state of natural parasitism. The spontaneous degeneration known as pleomorphism often occurs in the saprophytic phase; but infection of animals has been accomplished from fungi which have been grown saprophytically upon keratinized tissues *in vitro* for some time. The need for investigation of natural sources of infection raises some very interesting problems for the field mycologist. From what saprophytic substrata can a dermatophyte proceed to attack a human subject? How is the transference to the host accomplished, and by what kind of spore?

Classification of the 880 species of dermatophytes at present described is very difficult. Four different systems of grouping have been suggested, but the general mycologist would only be at home with that of Langeron and Milochevitch, which includes all the ringworm and favus fungi in the Gymnoascaceae, though perhaps, as yet, with insufficient justification. The system originally proposed by Sabouraud, and revised in 1929, is still the most useful to medical men. It also possesses sufficient parallels with the classification of the Fungi Imperfecti to enable it to be adapted mycologically as future researches should dictate. The local dermatophyte floras of various parts of the world are being studied, and

Drs. A. M. Davidson and P. H. Gregory have published their quota². The same two authors have also helped to simplify the problem of classification by their proof³ that the so-called 'mosaic fungus', often associated with ringworm attacks, is in reality an intercellular deposit of cholesterol crystals. Dr. Gregory discusses reports of the discovery of asci in dermatophytes, and considers their possible relationships with other fungi.

Certain species of dermatophytes cause a green fluorescence to appear on infected hairs when viewed in ultra-violet light. This is due to the presence of a water-soluble substance, and the fact is used to facilitate the diagnosis of ringworm. Dr. A. M. Davidson, S. A. Boyd and C. P. Haltalin have described a very simple and convenient apparatus for this purpose⁴. The work, which is the result of co-operation between a research worker, a physician and an electrical engineer, is typical of the determined team spirit which is very obvious in the publications of the Manitoba workers on dermatophytes, and should not fail to yield results of practical value to humanity.

¹"The Dermatophytes", *Biol. Rev.*, **10**, 208 (1935); and "The Parasitic Activity of the Ringworm Fungi", *Trans. St. John's Hospital Dermatological Society*, 56-65 (1935).

²"The Dermatophytes of Manitoba, Canada", communicated to the Ninth International Congress of Dermatology, and appearing in the first volume of deliberations of the Congress. (Budapest: "Patria"-nyomda. R.-T.)

³*J. Amer. Med. Assoc.*, **105**, 1262-1264 (October 19, 1935).

⁴*Canad. Med. Assoc. J.*, **33**, 534-536 (1935).

Educational Topics and Events

EDINBURGH.—Prof. James Ritchie, regius professor of natural history in the University of Aberdeen, has been appointed to the chair of natural history, in succession to the late Prof. J. H. Ashworth.

The degree of Doctor of Science has been conferred upon the following: A. B. Brown, for a thesis entitled: "Studies in Cambial Activity"; Sasindra Chandra Dhar, for a thesis entitled: "On certain Investigations of the Properties of the Functions of Mathieu, Whittaker, Weber and other Confluent Hypergeometric Functions: On the Uniformization of Algebraic Curves, and on certain Electromagnetic Waves in Gravitational Fields in Relativity"; Nancy M. Galpin, for a thesis entitled: "Biological and Statistical Studies on the New Zealand Romney Lamb, with reference to Relative Growth Gradients"; J. M. Stagg, for papers on "Terrestrial Magnetism, with special reference to the Magnetic and Non-photographic Auroral Data brought back from Fort Rae, North-West Canada"; J. Carmichael, for a thesis entitled: "Investigations into Tuberculosis in Uganda"; Philippus L. le Roux, for a thesis entitled: "Observations on Schistosomiasis and Paramphistomiasis in Sheep, and Notes on the Morphology of Helminths from Mammals and Birds in South Africa".

LONDON.—Dr. W. J. Hamilton, since 1935 lecturer and deputy director of anatomy at St. Thomas's Hospital Medical School, has been appointed University professor of anatomy (St. Bartholomew's Hospital Medical College).

It has been resolved to institute a B.Sc. degree in chemical engineering for internal students in the Faculty of Engineering.

The following D.Sc. degrees have been conferred: In agriculture, on P. H. H. Gray, of the Rothamsted Experimental Station; in botany, on W. A. Roach,