other was re-inoculated with bacterial film from the original culture. Both were almost colourless, as compared with the original deep brown colour, showing that much colloidal matter had been removed. Larvæ of *A. aegypti* were tested in these; growth was slow, and only a few reached maturity, but these showed no increase in hairiness when compared with controls.

These experiments, and those of Rosen and Rozeboom, suggest strongly that the factors producing hairiness reside in some non-living particle, commonly found in tree-hole water. In this case the particles appear to be much finer than was the case in Polynesia. In attempts to produce such particles in the laboratory, tests have been made of infusions of sawdust and suspensions of crude lignin, but none of these has caused any increase in hairiness of *A. albopictus* larvæ.

The nature of these particles is to be investigated further and the full results will be published in due course. Acknowledgments are due to Mr. Cheong Chee Hock for assistance with the photomicrographs, and to Dr. Lim Kok Ann for carrying out the filtration described above.

Donald H. Colless

Department of Parasitology,
University of Malaya.
Sept. 19.

[1] Rosen, L., and Rozeboom, L. E., *Amer. J. Trop. Med. and Hyg.*, 3, 529 (1954).

Distribution of Physiological Races of *Phytophthora infestans* (Mont.) de Bary in Northern Ireland

Early reports on the distribution of physiological races of *Phytophthora infestans* (Mont.) de Bary showed that specialized races occurred only in districts where resistant potato seedlings were raised and grown[1–3]. Furthermore, it was considered that the unspecialized race, later designated race 0, was the only one to cause disease in commercial potato crops.

More recent work, however, has shown race 4 in Holland[4], and a mixture of race 0 and race 4 in Canada[5], to be the 'common race'.

A further contribution to our knowledge of the distribution of the physiological races of *P. infestans* may now be made from a survey carried out in Northern Ireland. Diseased potato foliage was collected from all parts of the country in 1954 with the view of ascertaining the identity of the most widespread race(s). A further collection from a locality at which many potato varieties, including many *Solanum tuberosum* × *Solanum demissum* hybrids, were being grown was also made in order to obtain as many different physiological races of the fungus as possible. The isolates of the fungus were cultured on pea-meal agar at 15–18° C. and identified by the detached leaf technique, using the variety British Queen and Black's set of single-gene differentials as the differential host series.

From seventeen commercial varieties (all *S. tuberosum* derivatives), seventy-three isolates of the fungus were obtained. Of these, seventy were identified as race 4 and the remaining three as race 0. These latter occurred on the varieties Arran Victory, Ulster Supreme and British Queen.

A total of nineteen isolates was obtained from the hybrid varieties. Of these, six remained unidentified due to lack of pathogenicity, and from the reactions of the remainder race 1, race 2, race 4, races 1, 2, races 1, 4, and races 1, 2, 4 were identified.

It is evident that at least seven physiological races of *P. infestans* are present in Northern Ireland but only one, race 4, has a widespread distribution.

D. A. Doling*

Dept. of Mycology and Plant Pathology,
The Queen's University,
Belfast.

* Now at the Royal Agricultural College, Cirencester.

[1] Black, W., and Haig, J. C., *Scot. J. Agric.*, **27**, 49 (1947).
[2] Mastenbroek, C., *Euphytica*, **1**, 187 (1952).
[3] Muller, K. O., *NachrBl. dtsch. PflSchDienst*, **13**, 91 (1933).
[4] Mastenbroek, C., *T. Pl. Ziekten*, **61**, 88 (1955).
[5] Graham, K. M., *Amer. Potato J.*, **32**, 277 (1955).

Rhizoctonia in Natural Grassland Soils

An investigation into various aspects of the microbiology of natural grassland soils is being carried out in these laboratories to serve as a guide in future studies on the microbiology of soils under introduced pasture grasses.

The native 'low tussock grasslands'[1] of New Zealand, with *Poa* and *Festuca* spp. dominant, cover approximately 7 million acres and occur mainly in the South Island. Areas are found from sea-level to 3,000 ft. and they provide extensive grazing for sheep. Three locations were chosen for sampling, one in the North Island on soil derived from volcanic ash (Waiouru) and two in the South Island, one on soil derived from sandstone (Bealey) and the other on soil derived from schist (Alexandra).

In a study of the mycology of these soils, the screened immersion-plate technique[2] and a plating method described by Warcup[3] were employed in parallel studies. Modified screens were employed in the former by constructing them with sides to form a shallow box. When assembled, the sides of the screens fitted closely over the sides of the boxes carrying the agar-coated plates in a manner similar to the fitting of Petri dish halves. 2 per cent distilled water agar was used, and the diameter of the screen apertures was reduced to $\frac{1}{8}$ in. Isolations were made from ten sites in each location in the spring, summer and autumn seasons of 1953–54. A total number of 1,669 specimens of mycelium were isolated by the screened immersion plates, and, of these, 831 specimens exhibited features of hyphal morphology similar to those shown by strains of the fungus *Rhizoctonia solani* Kuhn[4].

The predominance of *Rhizoctonia* mycelium as shown by screened plates was a constant feature in the three locations, the fungus occurring in both top and subsoil. In contrast, mycelium of *Rhizoctonia* was not recorded on any occasion with the plating method, although a number of other fungi were isolated. The failure to obtain *Rhizoctonia* by this method may be associated with the difficulty of maintaining transfer cultures on potato dextrose and malt agars.

In the extensive literature pertaining to soil mycology studies, there are few references to the occurrence of *Rhizoctonia* in isolations[5]. The majority of references concerning this much-studied fungus deal with pathogenic activity, and the direct isolation of the organism from sources other than infected material is seldom recorded.