

islands, except Tierra del Fuego, are not closely related to those of the antarctic flora. One or two species seem to have migrated northward along the Andes to the Arctic, although there are great gaps in their present distribution. The species of Antarctica show much diversity in the Peninsula (11 species). *Usnea antarctica* ranges from Marie Byrd Land to the Queen Mary Coast and gives rise to six species along the coast of East Antarctica.

Species of *Buellia*, the largest genus in Antarctica (74 species), are found in practically every locality where collections have been made, but each species has a rather limited distribution. The group with a thallus of rhizomorphs and assimilative areoles seem endemic in Antarctica. *Lecanora*, the next largest genus (20 species), with the closely related *Omphalodina* (12 species), have their species about equally divided between the Peninsula and Marie Byrd Land to the coast of East Antarctica, but each species has quite limited distribution. *Lecidea* (28 species) occurs in most regions, with 16 species in the Peninsula and 12 from Marie Byrd Land to the coast of East Antarctica, but most of the species also have very limited distribution.

Rinodina frigida seems to be the most widespread lichen in East Antarctica. It is rather rare in Marie Byrd Land and the Edward VII Peninsula, but increasingly common in Victoria Land and even more so along the coast of East Antarctica. The species shows some variability, but has not yet segregated into geographic races or microspecies (260 specimens studied).

The species of *Alectoria* from the Peninsula are closely related to those of Tierra del Fuego and the Andean Mountains, while *A. antarctica* from Ellsworth Land to Ross Island, and *A. congesta* from Marie Byrd Land to Queen Maud Land, are very distinct, with lecideine apothecia, and might be considered a separate genus, more closely related to the subantarctic species of *Cladia* than to *Alectoria*.

The Biatorellaceae and related Acarosporaceae are quite uniform in thalline anatomy in the temperate zone and in alpine regions of the tropics, but have differentiated endemic genera or subgenera in Antarctica, with more highly differentiated structures in the thallus, suggesting a long segregation and independent evolution in Antarctica. In the case of *Biatorellopsis*, the more primitive species are found in Marie Byrd Land and the more highly evolved ones in the Peninsula, suggesting that the ancestors of the latter migrated from Marie Byrd Land to the Peninsula.

In summary, the lichen flora of East Antarctica to Marie Byrd Land and Ellsworth Land seems to

be an ancient flora surviving on nunataks during the last ice age and spreading northward with the return of milder climate. The flora of the Antarctic Peninsula seems to have been partly derived from Tierra del Fuego via the South Orkneys and South Shetlands since the ice age, but so long ago that there has been much subsequent differentiation of species.

Ecology and Floristic Investigations of Lichens

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Work continued during the past year on the writing of an analytical paper, using data accumulated during three summer field seasons (1961-1964) at Hallett Station and other locations in the Ross Sea sector. The mapping of lichen distribution and the text for that section of *Life on the Land*, a volume in the American Geographical Society's Antarctic Map Folio Series, was completed. Much of the introduction to that volume was also written.

A paper was submitted for publication in the Antarctic Research Series volume on soils, which is to appear shortly. Analysis of field collections of soil fungi, now in laboratory culture, and airborne disseminules, preserved on field-exposed slides, has indicated some local dissemination of plant propagules. This material is now being prepared for publication.

Anatomical Investigations of Weddell Seals

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During the past year, skeletal material and certain organs of the Weddell seal, *Leptonychotes weddelli*, were prepared and preserved for future studies. A detailed osteology and myology of the seal will be made by Jean A. M. Piérard, École de Médecine Vétérinaire de la Province de Québec. Comparisons will be made with earlier accounts of pinnipeds, especially of the Phocidae, to which family *Leptonychotes* belongs; special attention will be given to a search for phylogenetic evidence.