

a relict group than has the New Zealand *Dorcus*. Also, the distribution of *Lissotes* is much more continuous than that of *Dorcus*. Its absence from western and southern parts of the South Island and from Stewart Island may indicate that the group is of tropical origin and cannot tolerate a cold, wet climate or that it became extinct in these regions during a glacial period and has not yet recolonized them. Four localized but closely related species of *Lissotes* (*triregius*, *oconnori*, *mangonuiensis* and *stewarti*) occur in the Far North of New Zealand (see Fig. 32), and their formation seems to have resulted from isolation on islands in post-Miocene times of a formerly more widespread but flightless stock. Fleming (1962) shows the Far North as a group of islands during the Pliocene, and he has informed me (oral comm.) that the areas of sand now linking these islands are so low that they probably were covered by high level seas of interglacial intervals, including the Last Interglacial about 70,000 to 150,000 years ago. A comparison of these former (post-Miocene) barriers and the range of *Lissotes* in the Far North indicates that the origins of the northern species can be traced back at least to the Last Interglacial (see Fig. 32). The species on the Three Kings (*triregius*) may have been isolated during the Pliocene as this group of islands has been separated from the mainland by very deep seas since that time, and as *triregius* is no more distinct morphologically than *oconnori*, *mangonuiensis* and *stewarti* it is very likely that all four species date back more than 2,000,000 years. If so, their failure to spread into each others' range may be due to the unsatisfactory habitat of the dune-sand areas that link the old islands. The remaining three species of *Lissotes* (*planus*, *reticulatus* and *rufipes*) appear to have evolved from a southern stock that probably was separated from the northern stock by post-Miocene seas in the vicinity of the Auckland Isthmus. The spread northwards of *planus* and southwards of *stewarti* may have occurred in fairly recent times. *L. rufipes* has a very localized range in the South Island and could have evolved in a refuge in the Nelson District (? during the Last Glaciation). Morphologically (except for the hindwings) this species is very similar to *reticulatus* which occurs in both the North and South Islands as well as on islands in Cook Strait. *L. reticulatus* has probably extended its range very recently, perhaps while sea level was still low at the end of the Last Glaciation some 15,000 years ago, as North Island populations seem to be identical with those of the South Island. The Southern Alps no doubt are acting as a barrier in the westward spread of this species in the South Island.

*Dendrobax*, with a single highly variable species occurring throughout most of New Zealand at the present time, is related to *Streptocerus* Fairmaire, 1850, from Chile and to *Lamprima* Latreille, 1806 and *Phalacrognathus* Macleay, 1885 from Australia, New Guinea and Lord Howe Island. It is the only genus of this group in which sexual dimorphism is not apparent. Whether this absence of dimorphism is due to specialization or lack of specialization is not clear at the present time. *D. earlii* could be an old, plastic species rather than a recent invader as it is very distinct from its geographically nearest relatives.

The genus *Ceratognathus* occurs in Australia and Tasmania as well as in New Zealand. A large amount of speciation has taken place in this genus in New Zealand, and some of the species are morphologically very close to Australian species. It appears that basic generic characters of the group are very stable, but that "trivial" specific changes—e.g., allometric differences in the mandibles, and minor changes in the shapes of parameres of the male genitalia, have become fixed very rapidly in some populations. The genus has been in the New Zealand area long enough for an endemic species to evolve on the Chatham Islands, and