North Canterbury, are larger than those in dry Central Otago. Also, in *M. erichrysa* those from the driest habitat recorded for this species, Rakaia, are smaller and paler than specimens from high rainfall areas of fiordland. Specimens from the type locality of the Arthur Range fall about mid-way between these two extremes.

DISCUSSION

It is evident that the two mountain species are very closely related. Morphologically they differ only in size, but biologically they differ in their types of habitat and rates of larval growth. These features, and their very similar colour pattern, at first suggests that they are two ecological forms of the same species, however the following evidence establishes them as two distinct species. First, both species have occurred together on Mt Earnslaw on the same day (27/12/22, Fenwick) and on Ben Lomond, also on the same day (10/1/21, Fenwick). There are no intermediate forms from either of these localities. Secondly, I succeeded in cross-fertilising Homer Valley *M. erichrysa* and Crown Range *M. huttoni* imagos four times in captivity, once with a male *M. huttoni* and three times with males of *M. erichrysa.* The attractive scent of the female is similar in both species and copulation was successful, but of approximately 1,000 ova produced by the four matings, only five hatched. All were from one female which had laid 570 ova, and none reached maturity. Thirdly, the larval growth rates remained different for each species even when reared under identical conditions. It appears then, on the evidence available, that the two species are fully isolated in the Otago district where their distributions are adjacent or overlapping.

The methods of dispersal available to these species are limited to the larvae only. It is noteworthy that the larvae of all lepidoptera with flightless female imagos can feed on a great variety of plants, which enables them to wander from their normal habitat without the need to rely on a supply of a single plant species. In spite of being capable of migration, the larvae normally remain in small colonies. Male imagos are strong fliers and no doubt can cover extensive distances, probably from colony to colony, thus allowing an occasional exchange of genes and preventing each colony from diverging and becoming distinct forms.

On the basis of the close relationship between *M. huttoni* and *M. erichrysa,* is seems reasonable to assume that these have diverged relatively recently, while *M. strategica* has been distinct for a very much greater period of time. It is interesting to speculate on the geological and climatic factors which could be responsible for recent speciation in this genus by considering the present distribution of *M. huttoni* and *M. erichrysa,* one on the dry eastern side of the South Island ranges, the other largely in the high rainfall areas of the western ranges of both islands. The sequence of events was possibly as follows. In the Miocene a more or less continuous chain of low mountains occurred from the Ruahines southward to Southland, and a species of *Metacrias* was distributed along its whole length. Isolation of the Ruahines as an island was the first geological event to break up this extensive distribution, occurring about the U. Miocene or L. Pliocene (Fleming, 1949). The Tararuas remained connected to the South Island until the U. Pliocene, when Cook Strait was breached. A series of glacial advances followed in the Pleistocene, and although these are not known in detail, it is evident that in the last Alpine glaciation, permanent snow tipped the Tararuas and the N.W. Nelson mountains and descended to about 3,000ft at Stewart Island, lowering the life zones of the Alps some 3,000ft. In these conditions the South Island population could have been split into two groups, one on either side of the ranges. In their isolation the two groups diverged slightly, becoming adapted to the differing ecological conditions in the two