maxillary, the short anal fin, and the distance between the dorsal and the caudal, as well as in its markings.

Its eye is rather larger than usual, but I do not think that it is the young of *G. fasciatus*, on account of its large maxillary bone and the pale spot on the preoperculum, which is probably very constant in all ages of the fish. Also, *G. fasciatus* is not known to breed in the sea in New Zealand; the old ones are never caught going down to sea, nor the young ones going up the rivers. The only species of *Galaxias* in New Zealand which breeds in the sea is *G. attenuatus*, and the young, known as whitebait, ascend the rivers in spring in a much earlier stage of development than the present fish.

ART. XX.—*On Mites attacking Beetles and Moths.*

By W. W. SMITH, F.E.S.

[*Read before the Philosophical Institute of Canterbury, 6th November, 1901.*]

THE late Mr. Maskell was the first to record* the occurrence in New Zealand of the parasitic mite (*Uropoda vegetans*, De Geer) attacking the introduced woodlouse (*Porcellio scaber*, Latr.) and a native beetle. The beetle mentioned by Maskell is a species of *Elater*, and generally known as "click-beetles," from the click-like sound they produce when springing off the ground. The larvæ of several species of *Elater* have destroyed enormous areas of gorse fences in New Zealand during the last ten years by consuming the roots of the gorse-plants. I have now to record the occurrence of *Uropoda vegetans* parasitic on eight additional species of beetles and on two species of native moths.

On the 8th September last Mr. Edwin Thomas, of Ashburton, sent me a specimen of *Tricosternus antarcticus*, a large carnivorous ground-beetle, with many thousands of the minute reddish-brown mites adhering thickly to every part of the beetle's body. When the specimen reached me the mites were so numerous that they completely enveloped its body and legs so as almost to conceal it from view. They were nearly ¼ in. in depth on its back, while on the legs, especially the thighs and underparts, they were so matted together that it was with difficulty the beetle could walk. An examination of the parasite with the microscope showed it to be attached to

* Trans. N.Z. Inst., vol. xxv., p. 199.

its prey by an infinitesimally fine thread or cord. I have not seen De Geer's description of *U. vegetans*, but Maskell has defined its structural characters and its method of attachment to its host. Notwithstanding that I have collected several thousand specimens of *Coleoptera* in Ashburton County during the last fifteen years, I have not previously observed this mite parasitic on any specimens I have preserved. Captain Hutton, however, informs me that when collecting *Coleoptera* some years ago he noted it parasitic on several species in the neighbourhood of Christchurch.

Mr. J. H. Lewis, of Ophir, who is an enthusiastic collector and student of New Zealand *Coleoptera*, has also recently informed me that he has observed *U. vegetans* parasitic on the undermentioned species: *Uloma tenebrionides*, *Lissotes reticulatus*, *Thoramus wakefieldi*, *Pterostichus præcox*, *Æmona hirta*, *Coptomma variegatum*, and *Xilotoles griseus*. The three first named are wood-eating species, the fourth is a Carabid, and the three last are Longicorns, which shows that many species of beetles of very different habits are liable to be attacked by the mite. Mr. Lewis mentions having also observed it on a fly (unknown) in the Wellington District.

When on a visit to Ashburton lately Mr. G. W. Howes, F.E.S., informed me that he had twice observed *U. vegetans* parasitic on two species of native moths (*Xanthorrhoe beata* and *X. rosearia*) at Invercargill. They were attached to the sides of the thorax and the thighs of the moths. Although the mite would be of great service to man by destroying the destructive *Elater* and detestable woodlice, it is regrettable to see it attacking beautiful and useful native insects. The predaceous ground-beetles are invariably beneficial on farms, but are becoming rare in settled districts. Mr. Howes, my son William, and I, lately spent half a day collecting on the flax flat below the town of Ashburton and near the Ashburton River. Instead of finding great numbers of ants' nests, as formerly, under the half-embedded stones, we found their old homes tenanted by swarms of woodlice, some of them being abnormally large and robust, and very variable in colour. In several parts of this district the woodlice have almost displaced the native ants. Although we searched very carefully we were unable to detect the presence of the mite on any woodlice, or under the cool slightly damp undersides of the stones, to which they occasionally cling in groups. The year Mr. Maskell recorded the occurrence of *U. vegetans* in New Zealand I sent him infested woodlice from Ashburton; but I have not detected them in this neighbourhood since then, until the infested Carabid was received lately from Mr. Thomas. The specimen was found

in a cucumber-frame where woodlice are unpleasantly numerous, but they are apparently free from the mite in the frame.

Some time ago Captain Hutton remarked to me that it would be interesting to know if *U. vegetans* is indigenous or was introduced with *Porcellio*. It has only been detected in certain districts within the last few years, which indicates its being an introduced species now rapidly dispersing in New Zealand. The so-called "red-spider" (*Tetranychus telarius*), so destructive to fruit-trees, is also an introduced mite, common in America, Europe, and Australia.

The habit of some species of beetles and moths of concealing themselves in damp cool places during the day where the mite inhabits would readily enable the latter to attach itself to its host and become parasitic on many species. The milder climate of New Zealand will unquestionably favour its rapid dispersion and increase, as it has done many other both baneful and beneficial species of insects.

ART. XXI.—*Notes on* Coleoptera.

By J. H. LEWIS.

[*Read before the Wellington Philosophical Society, 5th November, 1901.*]

WITH the exception of moths and butterflies, none of the orders of insects occurring in New Zealand can be considered to be catalogued in even a moderately satisfactory manner. The most extensive order, that of *Coleoptera*, is in almost as bad a state as any, for although much has been done and a long list of species published, yet the number of coleopterous insects occurring here is so great and the students so few that it will be many generations before all the forms are described. Description, though a dry and tedious process, is a needful preliminary to the elucidation of the problems connected with distribution and variation, which are the most attractive portions of the study of natural history.

As in other orders, so among beetles, the male insect is often different in form from the female. Not sufficient cognisance has been taken of this fact, except where the describer of a species has himself been able to study the insects in their homes, or where he has attached some weight to the observations of the field naturalist who has collected for him. Some results of this are evident in Captain Broun's list, and a few are noted below with other synonyms. The frequent description of identical species in New Zealand and England