

ART. XLI.—On *Flabellum rugulosum*, Tenison-Woods.

By HENRY SUTER.

[Read before the Wellington Philosophical Society, 4th October, 1905.]

Flabellum rugulosum, Tenison-Woods, "Palæontology of New Zealand," part iv, "Corals and Bryozoa of the Neozoic Period in New Zealand," 1880, p. 12, figs. 8, a, b

Captain J. Bollons, of the Government steamer "Hinemoa," dredged living specimens of this fine coral in 50 fathoms between Cuvier and Mokohinau Islands, and very kindly presented me a specimen. Unfortunately, the animal had already been removed, but Captain Bollons told me that it was beautifully banded with white and scarlet. My example agrees in every particular with specimens from the Pliocene of Wanganui, but it is larger than any I have seen. Altitude, 44 mm. ; axis, 60 mm. ; min. axis, 20 mm.

This interesting addition brings the number of New Zealand species of the genus up to two, *F. rubrum*, Q. and G., being the other species. This latter is not uncommon on rocks at low-water mark in Hauraki Gulf, and is very conspicuous by its scarlet animal. Unfortunately, in alcohol the colour is completely lost.

ART. XLII.—Notes on Insect Swarms on Mountain-tops in New Zealand.

By G. V. HUDSON, F.E.S

[Read before the Wellington Philosophical Society, 2nd August, 1905.]

At a recent meeting of the Entomological Society of London, the president, Professor Poulton, F.R.S., read a short paper entitled "A Possible Explanation of Insect Swarms on Mountain-tops," in which he suggested as probable that "certain species of insects with powerful flight, after reaching the imaginal state, have the instinct to seek conspicuous isolated features in the landscape; that in others with smaller powers or unable to fly the instinct is merely to ascend. The effect of both tendencies is to reduce the area over which the sexes have to find each other. A somewhat deferred maturity, and the gradual collection of scattered individuals into swarms, is probably associated with the instinct in many cases, facilitating still

further the meeting of the sexes and the pairing of individuals from remote areas. It is obvious that the gathering swarm will be far more easily seen than single insects by the scattered individuals around. The swarming of beetles, &c., round tree-tops is probably to be thus explained. Related to the same combination of instincts preparatory to pairing is the driving-off of the winged males and females of ant communities, in response to probably some atmospheric stimulus which makes itself felt on a single day over a vast area." In connection with these general deductions by Professor Poulton, it has occurred to me that the few observations of the kind made by myself on New Zealand insects should perhaps be placed on record in the Transactions, especially as the perusal of these brief notes may possibly lead others to make fuller and more complete observations of a like nature.

On the 12th December, 1886, I observed on the highest hill to the south of Wellington Harbour great numbers of one of our commonest beetles, *Pyronota festiva*, together with a swarm of a common fly, *Bibio nigrostigma*. These insects were not numerous elsewhere, but were only abundant on the top of the hill.

On the 9th January, 1893, I observed on the rocks and stones on the top of Mount Enys, near Castle Hill, at an elevation of about 7,200 ft., a large swarm of ladybirds (*Coccinella 11-punctata*). There was no vegetation here which could have afforded food for aphides, and as ladybirds feed exclusively on aphides the inference is that the insects must have migrated to this high and inhospitable peak under the influence of some powerful instinct.

On the 22nd February, 1903, I observed vast swarms of *Pyronota festiva* flying over the birch-trees at the bush-line on one of the western slopes of Mount Earnslaw, at an elevation of about 4,000 ft. The afternoon was extremely hot, and the flight of the insects so rapid that I did not recognise them as beetles until after I had netted a few specimens for examination. The beetles must have been present in countless thousands, as they were swarming round the birch-trees and apparently equally abundant at all points along that slope of the mountain where I was collecting.

I have frequently observed the phenomena of ant-migrations mentioned by Professor Poulton, although I am only able to give three actually recorded instances. These cases prove, however, that the winged male and female ants were being ejected by the worker ants over very extended areas at the same time. It is probable that the flight of these vast swarms of winged ants gives rise, to a great extent, to that humming in

the air frequently noticed on very hot calm days towards the end of summer, and specially mentioned by Gilbert White in his "Natural History of Selborne."

On the 1st April, 1888, whilst collecting on the hills around Kilbirnie, I noticed that a great flight of the winged males and females of *Aphænogaster antarctica* was in progress. All the spiders' webs were full of the males, and numerous specimens of both sexes were found crawling on fences and about the ground. The ants were noticed over an area of fully two miles, but there is no reason to think that the swarming was confined to the country then traversed.

On the 31st March, 1889, I again observed this ant-swarming, this time over an extensive tract of hilly country to the south of Wellington. The ants were so abundant as to be almost intolerable to persons walking. The weather was very hot, calm, and sunny on both occasions.

On the 28th February, 1892, another very hot day, I observed, at Karori, swarms of the winged individuals of *Aphænogaster antarctica*. The "humming in the air" was very evident on this occasion, and was no doubt produced by the vast numbers of ants flying overhead.

Closely allied to the foregoing instincts is that of so-called "gregarious hibernation," which appears to occur in one of our common ichneumon flies, *Degithina buchanani*, but in this species it seems to be the females only which are thus found congregating. The following observations, made in 1883, have since been frequently repeated. In fact, as recently as May, 1903, I found these insects hibernating in large numbers between the weatherboards of my little observatory at Karori. On the 14th January, 1883, I observed, whilst collecting at Karori, a number of specimens of this fine ichneumon fly flying in and out of a crack in the bark of a large matai-tree. Being desirous of discovering what attracted them, I removed a large portion of the bark, and found that there were over sixty insects crowded together in the hollows and irregularities underneath. I captured several and examined a great number of them, and found them to be all females, there being no difficulty in at once determining the sex in this species. There was no nest of any kind in the tree, the cavity being merely a natural one, the ichneumon flies not having improved on it in any way. On the 3rd June of the same year I found a number of these insects under exactly similar circumstances, in the forest about five miles from Palmerston North. There were about a hundred specimens, and they were all females, and seemed quite torpid, this being due, no doubt, to the cold season of the year. On this occasion there were, of course, no specimens on the wing.