

ART. XXIII.—*On the Lepidoptera of Otago.* By A. BATHGATE.

[Read before the Otago Institute, January 11, 1870.]

THE niggardliness of nature in her providing for New Zealand has almost become proverbial, and she has certainly been far from liberal so far as insects are concerned. We are rather gainers by this, for though many insects are beautiful and useful to man, the majority either subject us to petty annoyances, or are positively noxious. We may miss the "first white butterfly" among the signs of spring; but we are saved from finding the caterpillars in our cabbage. We have no wasps and few ants, and except, perhaps, mosquitos and sand-flies, in remote localities, and the great plague of the aphid, or blight as it is usually called, we are, compared with other countries, free from insect pests. This paucity is more remarkable when we consider how imported insects thrive. The common house-fly (*Musca domestica*) has been accidentally introduced, and is now spread nearly all over the country, driving out to a great extent the native blow-fly. Nevertheless, although the number of insects in Otago is small, there is a large and not unimportant field for study.

The value of the study of entomology is so universally admitted, that any remarks which I may make in support of it may seem trite in the extreme; but there is one circumstance which occurred in Otago that I cannot refrain from mentioning, where a slight knowledge of entomology would have been of service. Four summers ago, I saw a person's lawn covered over with branches, and, on asking the reason, I was told that it was to keep the hens from scratching up the grass, for doing which they had suddenly taken a fancy. I went and looked at the lawn, and found that it was full of grubs, which were eating the grass roots, and that the fowls were scratching the grass to get at these grubs, which were the larvæ of a small brown beetle belonging to the genus *Elaterridae*, that sometimes eat the grass roots to such an extent as to cause large patches of it to wither up as if scorched by fire; my friend, in fact, was taking some trouble to prevent the fowls rendering him a great service.

The elater I have seen in New Zealand bears a very close resemblance to one of the British species. I am unable to say whether it is exactly the same, but the likeness was so great as to suggest the idea that this insect might have been introduced with the grass seed. If I be correct in my conjecture, it would be a very strong argument (if any be needed) in favour of the urgent necessity for the introduction of British insectivorous birds. The starling, a few of which have, I think, been successfully acclimatized here, would prove an inveterate enemy to these grubs. The grub I have referred to is not the only pest of the kind with which we have to contend, for the larvæ of the crane-fly, of which we have a representative in Otago, are also addicted to similar pursuits.

I shall give another example, which shows that it sometimes requires a little observation to know our insect friends from our insect foes. One year, when the hop-aphis was very destructive in Kent, the Kentish folks noticed great numbers of lady-bird beetles on the hops, so they immediately concluded that they were the origin, or at least, partially the cause of the evil, and destroyed numbers of them. This was, however, far from being correct, for the lady-birds live on the real culprits, the aphides. I mention this fact because the aphis is already a nuisance here, and because there is also a lady-bird which I have seen on two different occasions in the act of sucking a juicy aphis. This pretty little lady-bird is the only representative of the *Coccinellida* I have observed in Otago, and it seems to be widely distributed over the province. It is little more than half the size of the commonest British variety (*Coccinella septem punctata*), is coloured black, and has twelve orange spots on the elytræ, and two on the thorax.

We have many other insects which are injurious, though their effects may not be so apparent, or so widely spread, as is the damage caused by those I have just mentioned. Thus, we have beetles which are destructive to the timber, and others which injure the foliage of our trees. Indeed, I have seen some willow trees almost completely denuded of their leaves by a little brilliant green beetle. The grasshopper, too, which in some parts of the province swarms in countless numbers, must devour a large quantity of valuable grass.

There are also several insects of very strange appearance to be found in Otago. One of these is the "walking-stick" of the colonists, which is an apterous insect, belonging to the order *Orthoptera*, and the tribe *Phasiuina*. It derives its name from its extraordinary resemblance to a twig; it is usually about an inch and a half long, but one specimen which I have seen was nearly six inches in length; again, the pupa of the native cicada, or, as it is commonly called, the singing locust, presents a very remarkable appearance. It is found in the ground, is active, and in form greatly resembles the perfect insect, only it is without wings, and is provided with a pair of huge claws like those of a lobster, which give it an exceedingly ferocious appearance; but whether they are used for carnivorous purposes or only for cutting the roots of plants I do not know. The pupa works its way out of the ground before the cicada bursts forth, and the empty cases may frequently be observed sticking to a tree or post. The sharp chirruping noise made by the perfect insects must be familiar to all. The Otago cicada has a peculiarity which is noticed in the variety common in the south of Europe by an old Greek poet, and which is, that these loquacious gentlemen "all have voiceless wives."

I have never been able to meet with a classified list of New Zealand insects, and whether or not such a thing exists I am unable to ascertain. If a list has ever been published, I have no doubt of its being a very imperfect one. Hochstetter mentions that there are 215 genera, including 265 species,

of insects found in New Zealand, but I am sure that must be very much under the number, because he puts the *Lepidoptera* down at fifty-five, and I feel certain that that order has many more species.

There are sixty-six species of British butterflies, while the moths number nearly two thousand. I have myself observed in Otago alone, four or five species of butterflies, and more than twenty species of moths, but as to the numbers I have captured I cannot speak positively, for my entire collection has unfortunately been recently completely destroyed.

Of the butterflies, the most striking, and one of the commonest, is a representative of the *Vanessidi*. This butterfly is almost an exact facsimile of the English *Atalanta*, or red admiral, which it resembles both in the deep black grounding and brilliant scarlet bands of the upper side, as well as in the beautiful pencilled tracery of browns and greys underneath. It is the earliest of our butterflies; I have observed an early specimen flitting about among the spring flowers on a bright day towards the end of August or beginning of September. On catching any of these, the wings generally present a very torn and tarnished appearance, so that I have little doubt they hibernate. There are probably two broods of them in each year—one leaving the chrysalis about midsummer, and the other in the autumn. I do not know upon what the larvæ of this butterfly feed, nor, indeed, do I know the food of the larvæ of any of the New Zealand *Lepidoptera*, for I have never reared them; but I have never seen any caterpillars which at all resemble those of the same family found in Britain.

The genus *Pieris*, which includes some of the commonest British species, is, so far as I know, without a single New Zealand representative. Another butterfly common in the neighbourhood of Dunedin is one which, I think, belongs to the *Satiridi*, some members of which family it greatly resembles on the upper side, though the under side has silvery markings, which in England are peculiar to the *Argynnidi*. I am, however, almost certain that there is a *Fritillary* to be found in Otago; for one day, in the interior of the province, I saw a butterfly, which, both by its general appearance and style of flight, led me to believe that it must be referred to that genus. Some of the species of these butterflies are so exceedingly local in their habits that we might have several forms, and yet they might not be discovered for a long time, even if there were many collectors.

There is another very pretty little butterfly which is not uncommon; it bears a strong resemblance to the small copper *Chrysophanus phlæas* of Britain, though it is rather larger. The genus *Polyommatus* has one, if not two, species; one resembles the *P. Artaxerxes*, with a tinge of blue, and the other has more blue, but whether these are distinct species or merely varieties, I cannot decide, even possibly it is only the difference of the sexes. These lively little butterflies are widely spread over the open grass lands, and numbers of them

may be seen during the summer, dancing with their peculiar jerky flight over plats of short grass by creek sides and in similar situations. I have now mentioned all the butterflies which I know of existing in Otago ; they are few in number, but there must be several other species to be met with if they were to be searched for.

Of the moths of Otago, the commonest is a day-flier, which has black wings with white spots, the abdomen annulated with orange, and the antennæ pectinated. This moth is frequently mistaken for a butterfly. This, however, it is not, but a true moth, belonging to the family *Cheloniidæ*. It is common all summer, and makes its first appearance in October. There is another representative of this family which I have met with, and which, though not so handsome as some of its British congeners, is one of the most brilliantly coloured New Zealand moths known to me. In appearance it greatly resembles the wood tiger (*Nemeophila Plantagenis*), is a strong flier, and difficult to capture, though, like the previous one, it also enjoys the sunshine. The larvæ are black hairy caterpillars, which do not seem to be at all particular as to what they eat, for they seem to devour indiscriminately the grass and other small herbage. I have seen them in the interior, in the neighbourhood of Hamilton and Hyde, where, in the early part of the summer of 1866, they were so numerous as to blacken the ground in places, especially where the shorter grass grew, at the sides of tracks or water races. There are probably two broods a year, for the moths from the early brood come out about the end of November and beginning of December. There is another moth common up-country which I have only noticed where spear-grass (*Aciphylla Colensoi*) abounded ; it is remarkable more for its size than its beauty, for it is all of a light fawn colour. It is, however, the largest of the Otago moths I have seen, yet not very large, being only three inches across the wings. Whether the larvæ feed on the spear-grass, or on some plant which grows in the same places, I know not.

The *Geometrina* are pretty well represented. There is one insect in this family which is very common, and which is rather handsome though its colours are sombre, for its markings are pretty, and it is much larger than the majority of the moths of this group. It may be found by searching during the day in the corners of out-houses and in other dark places.

Our commonest moth in Otago is one belonging to the *Nocturna*, as it may be caught almost any summer night in great numbers by exhibiting a light. There may be, I think, two or three kinds of this moth, for I have seen specimens bearing a great family likeness, and yet showing great diversity in their markings ; yet even among those I had in my possession, there were some specimens which I felt sure belonged to the same species, and yet the markings varied considerably.

The last moth I shall refer to is one belonging to the *Hepialidæ*, which

is very common about the end of October and beginning of November. It is of a reddish brown, with lighter longitudinal spots on the upper wings; the larvæ feed on the roots of grass, and the chrysalides I have found in great numbers in newly-turned grass land early in October. There is another form with two white longitudinal lines on the fore wings.

There is a moth which, though not a native of Otago, I shall bring under your notice, as it is one of the natural curiosities of New Zealand.* It is a native of the North Island, and its peculiarity is a disease in the larvæ state. Many of these are killed just before turning into the pupa form by a fungus which grows upon them, which is known as *Sphaeria Robertsii*. I have seen a dried specimen, and it presented a very singular appearance, with the fungus nearly twice as long as the caterpillar, growing from the neck. It is called aweto by the natives, by whom it is eaten.

I observed in the *Otago Daily Times*, some little time ago, some extracts from a paper read by Mr. Travers before the Institute in Wellington, in which he stated that moths were very numerous in New Zealand. Whatever may be the case in the North, I do not think his remark would apply to Otago; at least, so far as my observation goes, I should say that, compared with Britain, the varieties of moths are few, although some species abound in very great numbers.

Before concluding, I shall offer a suggestion to the Institute, which I trust they will at least deem worthy of consideration. It is, that they should offer a prize for the best collection of some natural objects which may be decided on, and perhaps varied every year, the collections, or the best and rarest specimens, to be retained for the Museum; such prize to be competed for by the children attending the various schools in Otago. I think that a few pounds annually expended for that purpose would be well spent. As an instance of the probable good effect such incentives might produce, I may state that there is a well known school in the neighbourhood of Edinburgh, called Murchiston Castle, where for a long time it has been the custom to turn the attention of the boys to scientific studies, and that that school had the honour of educating both the first and second naturalists chosen to accompany the late Abyssinian expedition. And though few, perhaps, can earn their livelihood by such pursuits, yet they beget in all, habits of observation. But apart from any consideration of mere utility, by encouraging boys in such studies you open to them the doors of a boundless store of enjoyment. I know of few greater pleasures than

“ To wander forth, rejoicing in the joy
Of beautiful and well-created things.
* * * * *
To see and hear, and breathe the evidence
Of God’s deep wisdom in the natural world.”

* It is to be found among the roots of rata trees in many parts of Otago and near Dunedin.—Ed.