

which the larvæ feed and hibernate in any exposed situation, several species of *Noctuæ*, of which the larvæ live underground, are always abundant, and the country is actually rather *rich* in those species of *Tortricina* which feed and hibernate entirely within the stalks or roots of plants.

It is worthy of notice, that there are a very few species which have appeared unable to cope with severe cold. *Lobophora viretata* was tolerably common here during the first three or four years of which I have been writing, but after the first *cold* winter it became scarce, and has since almost disappeared. Its favourite locality was turned into a school playground and destroyed, but the decrease is also observable in the casual specimens which used to be found sitting on the fronts of houses, windows, gates and elsewhere all around the neighbourhood, of which hardly one occurred last year. *Diasemia literalis* has also been scarce for the last three years, but I have no great fear that it is dying out, since we have found casual specimens in two fresh localities.

Pembroke: 10th April, 1882.

NOTES ON THE NEUROPTERA OF STRATHGLASS, INVERNESS-SHIRE.

BY J. J. KING.

Having spent July and August of 1880 in a locality, to the Neuropterous fauna of which, very little attention has been paid, it has been suggested to me that I should make out a detailed list of my captures for this Magazine.

Strathglass is situated to the north of Loch Ness, being parallel with it; the Strath proper commences about nine miles from Beauly, and continues for about ten miles across the country in a south-westerly direction. It is for the most part about three-quarters of a mile broad; from south-west to north-east it descends in a series of terraces, which are almost level, these terraces are covered with small water-worn boulders, all which suggest to one the idea of its having been once the bed of a large lake; this idea is further borne out when the falls of Kilmorack are visited, the rocks at this place having the appearance of being wrenched asunder and hurled into the valley below, as if the pressure of the water above had been too much for them.

The Strath is very warm, the hills rising on either side rather abruptly to a considerable height, help to shelter it. The river

Glass, which has its source near Ben Attow, close to the west coast of Scotland, flows through it in a somewhat deep channel, and discharges itself in the Beaully firth. About seventeen miles from Beaully the Cannich joins the Glass; this place, where there is a small village containing a good hotel, I made my head quarters. Invercannich is, in fact, the centre of the district, all the churches are situated near here, and on Sundays it is quite a busy place, the people having to come in some cases upwards of twenty miles to get to church or obtain a glass of the national beverage.

This is one of the best localities I have ever visited for *Neuroptera*, more particularly *Trichoptera*, as water is plentiful in many conditions. A swift deep river (the Glass) traverses the Strath; then we have the Cannich, passing over many falls in its course before it reaches the Glass, which makes it very suitable for certain species of caddisflies; burns of all sizes abound, while Lochs and "lochans" are too numerous to mention, these latter occurring at all heights on the surrounding hills, and as for ditches and marshy ground, the difficulty is to keep clear of them.

During the two months I staid in the district, little or no rain fell, but during the night a heavy fall of dew took place. In the day time the heat of the sun's rays made it almost impossible to undertake any long excursion, hence most of my collecting took place not far from Invercannich.

TRICHOPTERA.

Upwards of two-fifths of the British species of this group were taken.

Phryganea striata, L., a few odd specimens occurred in various localities. *P. obsoleta*, Hag., was the common species of the district, at no Loch or Lochan was it absent; I have had as many as a dozen in my net at one time while sweeping. In Glen Cannich, at a small peat-hole during an exceedingly warm day, I observed a very light coloured ♀ of this species thrice descend about eighteen inches into the water, using a reed to walk on, no doubt it was in the act of oviposition, it evidently came to the surface of the water to get air, as in each case it merely came to the water's level, turned round, and deliberately walked down again; each time, I should think, it stopped down about one minute and a half; the insect seemed strange to me, and I could not resist the temptation to catch it when it made its appearance on the surface the third time.

Glyptotaleus pellucidus, Oliv., occurred at many of the Lochs, but was not common.

The genus *Limnophilus* was well represented, fifteen out of the twenty-four British species being captured.

Limnophilus rhombicus, L., common. *L. borealis*, Zett., three specimens turned up at different Lochs. *L. marmoratus*, Curt., common everywhere. *L. stigma*, Curt., rare. *L. lunatus*, Curt., abundant at all levels. *L. ignavus*, Hag., one speci-

men. *L. centralis*, Curt., very common. *L. vittatus*, Fab., equally common with the last. *L. affinis*, Curt., rare. *L. auricula*, Curt., frequent. *L. griseus*, L., some nice varieties of this common species were taken. *L. extricatus*, McL., one specimen. *L. luridus*, Curt., a few specimens were taken. *L. hirsutus*, Pict., one specimen. *L. sparsus*, Curt., occurred in swarms, some well-marked forms were taken.

Anabolia nervosa, Curt., common.

Stenophylax stellatus, Curt., very common along the banks of the Glass.

Micropterna sequax, McL., rare.

Halesus radiatus, Curt., common. *H. auricollis*, Pict.; the ♂ of this species was abundant during the last week of August, a few ♀s were taken in the beginning of September.

Sericostoma personatum, Spence, was frequent.

Silo pallipes, Fab., not uncommon.

Cruncacia irrorata, Curt., a number were taken along with the following species.

Lepidostoma hirtum, Fab., very common on all the streams.

Berea maurus, Curt., occurred sparingly on some of the burns.

Molanna palpata, McL., was one of the commonest species at all the Lochs; the semi-transparent ♀ is very different from the ♂.

Odontocerum albicorne, Scop., was common.

Leptocerum fulvum, Ramb.; a number were captured on the banks of the Glass by beating the bushes. *L. alboguttatus*, Hag.; a few specimens were taken with the last. *L. aterrimus*, Steph.; both the black and brown varieties were very common at all the Lochs, more particularly those above Tomich. *L. cinereus*, Curt., almost as common as the last. *L. albifrons*, L., very common along the Glass. *L. bilineatus*, L., in clouds around the Lochs above Tomich and elsewhere.

Mystacides nigra, L., *M. azurea*, L., and *M. longicornis*, L., all three species were common about the Lochs.

Trienodes bicolor, Curt., in numbers on the Lochs above Tomich.

Æcetis ochracea, Curt., and *Æ. lacustris*, Pict., turned up occasionally at various Lochs.

Hydropsyche instabilis, Curt., very common everywhere.

Philopotamus montanus, Don., in considerable numbers along the Cannich; one specimen of the var. *scoticus* was taken.

Wormaldia mediana, McL., two specimens occurred with the next species. *W. subnigra*, McL., the Cannich produced this species in abundance towards the end of August.

Plectrocnemia conspersa, Curt., rare.

Polycentropus flavomaculatus, Pict., was common along the Glass and Cannich. *P. Kingi*, McL., was taken along with *flavomaculatus*; it was described in the Ent. Mo. Mag., vol. xvii, p. 254.

Holocentropus dubius, Ramb., rare.

Cyrnus trimaculatus, Curt., very common everywhere.

Tinodes Wæneri, F., by no means rare.

Psychomyia pusilla, L., abundant.

Chimarra marginata, L.; this beautiful species was very common on the moss-covered stones along the banks of the Cannich.

Rhyacophila dorsalis, Curt., was always turning up where it was neither expected nor wanted.

Glossosoma Boltoni, Curt.; a few specimens were taken. *G. vernale*, Pict., was very common.

Agapetus fuscipes, Curt., and *A. comatus*, Pict., were both abundant.

Hydroptila sparsa, Curt., very common on all the streams. *H. forcipata*, Eaton, also common.

Ithytrichia lamellaris, Eaton, common.

Orthotrichia angustella, McL., a few specimens were taken.

NEUROPTERA-PLANIPENNIA.

Sialis lutaria, L., common. *S. fuliginosa*, Pict., also common; I took one specimen which measures nearly one inch and a half across the wings, on a burn near Corriemoney.

Sisyra fuscata, Fab., frequent.

Micromus paganus, L., very common.

Hemerobius marginatus, Ste., very common in Glen Affrick. *H. limbatus*, Wesm., common. *H. nervosus*, Fab., not uncommon. *H. subnebulosus*, Ste., odd specimens occurred.

Chrysopa flava, Scop., common. *Ch. vittata*, Wesm., common.

Coniopteryx tineiformis, Curt., occurred commonly by beating alder bushes, &c., growing near small burns. *C. aleyrodiformis*, Ste., taken with the last species.

Panorpa germanica, L., common, by sweeping rank herbage, &c.

PSEUDO-NEUROPTERA.

PSOCIDÆ.

Atropos divinatoria, Müll., in the house.

Clothilla pulsatoria, L., unfortunately rather common in the house.

Psocus sexpunctatus, L., a few taken. *P. bifasciatus*, Latr., common everywhere.

Stenopsocus cruciatus, L., very common in oaks.

Cæcilus flavidus, Ste., very common in all stages; this species varied considerably in the arrangement of the wing-veins. *C. vittatus*, Latr., not uncommon.

Elipsocus unipunctatus, Müll., very common. *E. Westwoodi*, McL., very common. *E. hyalinus*, Ste., abundant. *E. flaviceps*, Ste., equally common with the last. *E.* — *sp.*?, allied to *cyanops*, but larger, &c.

EPEHEMERIDÆ.

Leptophlebia marginata, L., very common. *L.* — *sp. nov.*?

Ephemerella ignita, Poda, occurred in clouds during the afternoon in August.

Cloëon simile, Eaton, common.

Bætis rhodani, Pict., in swarms. *B. pumilus*, Burm., with the last.

Siphylurus lacustris, Eaton, rare.

Rhithrogena semicolorata, Curt., very common. *R.* —sp.?, *R.* —sp.?, *R.* —sp.?, these three forms may only be varieties of *semicolorata*, but they differ very considerably from that species, but owing to not having specimens preserved in fluid, they cannot satisfactorily be made out.

Heptagenia elegans, Curt., common. *H. longicauda*, Ste., everywhere. *H. lateralis*, Curt., a few were taken.

ODONATA.

Leucorrhinia dubia, Van d. Lind., one specimen was taken in Glen Cannich.

Sympetrum striolatum, Charp., common. *S. scoticum*, Don., abundant in Glen Cannich.

Libellula quadrimaculata, L., near most of the Lochs.

Cordulia metallica, Van d. Lind.; a few specimens were taken after much hard work. *C. arctica*, Zett.; I have a specimen of this species in my cabinet taken by Dr. Buchanan White, many years ago in Strathglass, but I was not fortunate in observing the species myself, although Dr. White gave me all the assistance he could.

Cordulegaster annulatus, Latr., in many localities.

Æschna juncea, Müll., abundant in all the Glens.

Pyrrhosoma minus, Hans., a perfect pest at all the Lochs.

Agrion cyathigerum, Charp., equally common with the last species.

This gives as the result of my trip 111 species, or, excluding the four doubtful species of *Ephemeridæ*, 107, more than half this number being taken up with the *Trichoptera*, namely, 63; the *Neuroptera-Planipennia* absorbing 13; leaving the remainder for the *Pseudo-Neuroptera*.

In conclusion, I have only to acknowledge the kindness with which my friend Mr. McLachlan has unravelled many of the more knotty points among the *Trichoptera*, and the assistance I have received from the Rev. A. E. Eaton when working at the *Ephemeridæ*.

207, Sauchiehall Street, Glasgow:

April, 1882.

THE TARSAL AND ANTENNAL CHARACTERS OF *PSOCIDÆ*.

BY PROF. H. A. HAGEN.

By a mere chance I see that a statement recently published by me concerning the tarsal structure of *Psocidæ* confirms, in a most satisfactory manner, that made by Prof. Westwood in 1857 (Proc. Ent. Soc. Lond., series 2, vol. iv, pp. 63, 64) regarding certain *Coleoptera*.

Being occupied with the *Atropina*, I was astonished to find that the young forms have only two-jointed tarsi (instead of three-jointed, as is found in the imago), but the last joint, internally, in the middle, shows a more or less visible division, where the 3rd joint (the median)

Bibliography of the Neuropterida

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