

3-1-1911

## The Entomologist: An Illustrated Journal of General Entomology No. 574

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*J. H. Fuson*

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Vol. XLIV.]

MARCH, 1911.

[No. 574.

*The Humble Bees of Formosa*

*J. D. A. Coquillett*

THE

*pp. 100-102*

# ENTOMOLOGIST

AN

Illustrated Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

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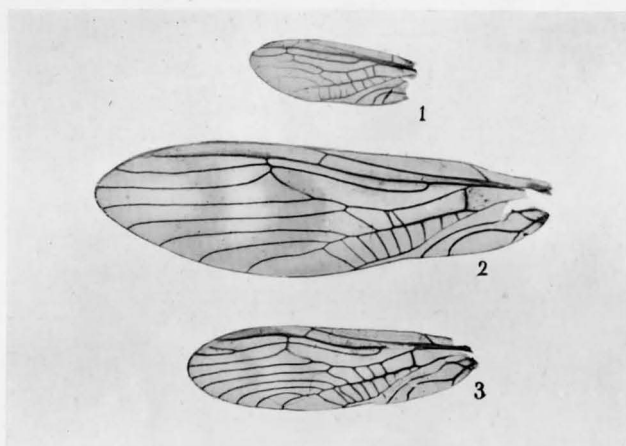
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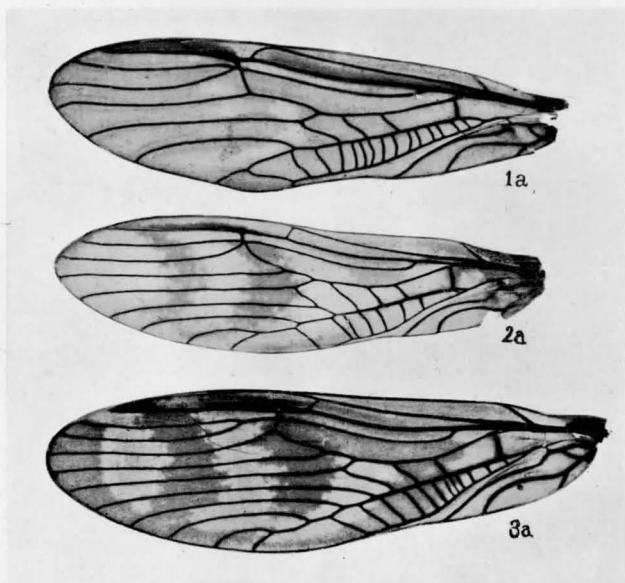
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MALES.

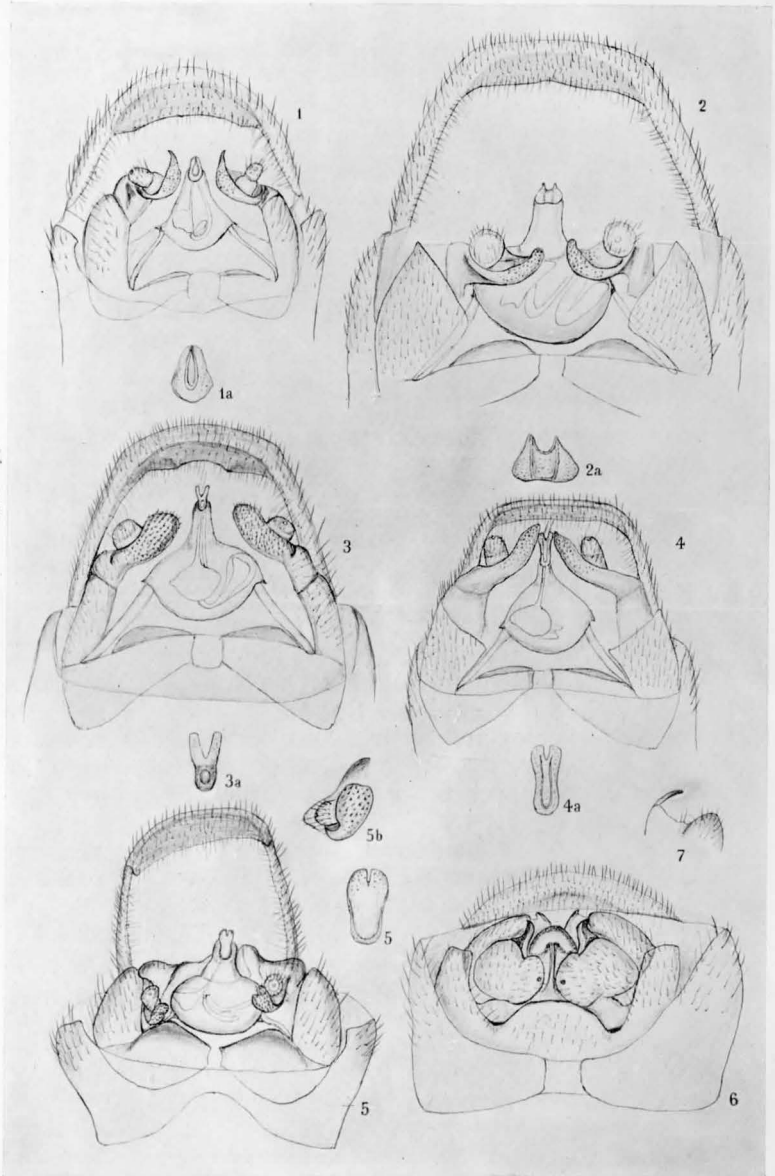


FEMALES.

Dr. Fr. Ris photo.

West, Newman proc.

FORE WINGS OF TÆNIOPTERYX.



K. J. M. del.

West, Newman proc.

THE GENUS TÆNIOPTERYX.

# THE ENTOMOLOGIST

Vol. XLIV.]

MARCH, 1911.

[No. 574

## ON *TENIOPTERYX PUTATA*, NEWMAN (PLECOPTERA), WITH NOTES ON OTHER SPECIES OF THE GENUS.

BY KENNETH J. MORTON, F.E.S.

(PLATES II. & III.)

IN the Trans. Ent. Soc. Lond. 1896, p. 58, when describing *Teniopteryx risi*, I made some remarks on *T. trifasciata*, Pict., partly based on material from Scotland in my own collection, and partly on Continental specimens received for examination from Mr. McLachlan. The species of the genus were, however, at that time very imperfectly understood, and in the light of what is now known it is almost certain that what I had then before me as *T. trifasciata* did not all belong to the same species. The material is not now available for re-examination. Quite a number of species belonging to the genus have since been satisfactorily separated. At the same time, I am not sure that unanimity of opinion yet prevails as to what constitutes the true *T. trifasciata* of Pictet.

In the paper above-mentioned, the insects from Scotland were certainly what I then regarded as typical *T. trifasciata*. This determination was, I admit, to a great extent due to the fact that both McLachlan ('Catalogue of British Neuroptera,' 1870) and Albarda ('Catalogue des Neuroptères observées dans les Pays Bas,' &c., 1889) had referred Newman's *Nemoura putata* (the type of which was from Scotland) to *T. trifasciata*, Pict. Klapálek, on the other hand, has since put forward the view that the true *T. trifasciata* is to be found in an insect which he took at Vienna, in which the wings of the male are very much more reduced. I have not seen the female of this Vienna insect, but the male is a very different thing from the Scottish representative of the *trifasciata* group. Certainly, on the whole, Klapálek's insect comes nearer to Pictet's figure than does the Scottish insect, to which, as far as I am able to judge at present, the

name of *putata*, Newman, must be applied, if Klapálek's view proves to be right. The final solution of the question will probably rest with the Swiss entomologists, when materials have been obtained from Geneva.

Newman's description of his "*Nemoura putata*" appeared in the 'Entomological Magazine,' vol. v. p. 401 (1838), and his diagnosis (for a copy of which I am indebted to Mr. Herbert Campion) is as follows:—

"*Nemo. putata*.—*Fusca, nitida; antennæ moniliformes, alis fere longiores, et cum pedibus, concolores: alæ fusco-tinctæ, brevissimæ, metatibias sedentis haud dimidio exporrigentes.* (Corp. long. .3 unc.; alar. dilat. .55 unc.)

"Inhabits Scotland. Taken by Mr. Walker at New Lanark: will form a genus of future authors."

This diagnosis, without material change, is repeated in the 'British Museum Catalogue of Neuropterous Insects,' Part I, 1852, p. 190, but there is nothing there to indicate that the Museum possessed an example. Nevertheless, the presumption is strong that Newman's type went to the British Museum. Professor Lowne, the Curator of the Entomological Club's Cabinets, informs me that he never had either Newman's British or foreign *Perlida*, although he remembers seeing them at Newman's, and he suggests that they went to the British Museum. The late Mr. McLachlan long ago told me that Newman's foreign *Perlida* were in the British Museum, but he was never quite satisfied that the British examples were there, and I suppose the official records throw no light on the point.

Mr. Herbert Campion very kindly made a search in the Museum Collection for this type, but without conclusive results. I suppose it is a well-known fact that Stephens's collection of Neuroptera was at one time arranged by someone who was not quite an expert in the order, and who seems to have been the cause of seriously impairing the value of the collection to future workers. Mr. Campion reports that there are three insects in the British cabinet over a printed label reading: "21 *putata* Newm." Two of the insects, he says, have clearly nothing to do with the present question, but the third is of importance, and Stephens's own MS. label pinned beside it seems to relate to that specimen alone. Mr. Campion is satisfied, after comparing it with one of my males from Clydesdale, that the two belong to the same species. I am much inclined to think that this specimen is either the actual type, or at least that it may have been received from the same source—that is, from Henry Walker, of New Lanark.

While unfortunately it is not possible to get that absolute proof which a comparison with the known type would have

afforded, yet Newman's description can hardly refer to anything else than to my earlier *T. trifasciata*. The locality, New Lanark, refers no doubt to the River Clyde, near that place. The banks of this river, which were my favourite hunting-grounds for many years, produces in early spring two species of *Tænipteryx*, both of which have short-winged males, but the reference to the moniliform antennæ can apply to my *trifasciata* alone.

The British species of *Tænipteryx* are three in number, viz. *putata*, Newman, *risi*, Morton, and *nebulosa*, Linné.

Little needs to be said about the last-named, which is separable from the others at a glance. Klapálek has placed it in a separate genus, *Nephelopteryx*. If the two genera are adopted, they may be distinguished thus:—

Cubitus of the fore wings emitting two to four branches outwards to the hind margin. Ventral plate ( <i>lamina subgenitalis</i> ) of the male long . . . . .	<i>Tænipteryx</i> , Pict.
Cubitus of the fore wings emitting but one branch outwards to the hind margin. Ventral plate of the male short . . . . .	<i>Nephelopteryx</i> , Klap.

In British examples of *nebulosa* the male, as has been indicated, has frequently very much abbreviated wings, but not always so; specimens occasionally appear almost as full-winged as Continental examples. Mr. Martin E. Mosely recently sent me one from Dovedale in full-winged condition. It may be that micropterism is more dominant in the North, but it is probably not confined to that quarter. When the wings are full in the male, it of course approaches in appearance to the female. The shortest-winged males are very remarkable, sprawling creatures, the legs appearing to be out of all proportion to the size of the insect. The short-winged forms seem to have the apical process of the *valvula subanalis* shorter than is usual in the long-winged condition (see fig. 7), but there is no very striking difference, and there may be a certain amount of individual variation. The short-winged male of *nebulosa* may also be separated from the male of *putata* by the moniliform antennæ of the latter. The wing-markings in *nebulosa* are usually very vague, and I cannot say that I have ever seen a female example with such distinct fasciate markings in the wings as are shown in Albarde's figure ('Annales de la Soc. Ent. Belg.' xxxiii. pl. i.). *T. nebulosa* appears very early, from February to April, according to locality and season, and it seems to last but a short time.

The two other species, *T. risi* and *T. putata*, present no difficulty in determination. The latter, as a rule, occurs earlier than *risi*, but *risi* may be found as early as April along with the others, while it continues to appear in higher districts even to July.

The differences between the two species may be tabulated thus:—

## MALES.

- a. Short winged; in fore wing three sectors, as a rule, going from cubitus to hind margin; neuration rather close, and markings in British examples, at least, usually small and faint. Antennæ rather thick, joints moniliform. Ventral plate not produced at the apex, the margin of which is excised . . . . . *putata*, Newman.
- aa. Full winged; in fore wing two sectors, as a rule, going from cubitus to hind margin; neuration wider; fasciate markings usually distinct. Antennæ slender, joints not moniliform. Ventral plate produced, upturned, margins entire . . . . . *risi*, Morton.
- (For side view of ventral plates, see figs., Trans. Ent. Soc. Lond. 1896, pl. ii.)

## FEMALES.

- a. Wings with three more or less distinct fasciæ, and in addition the apex of the wing is occupied by a well-defined marking which may be connected posteriorly with the immediately preceding fascia, but which is frequently separated therefrom anteriorly by the space between the radial sector and the radius; three or four sectors going from cubitus to hind margin *putata*, Newman.
- aa. Wings with three more or less distinct fasciæ, but the apex of the wing without any well-defined marking, although the whole apex beyond the outmost fascia may become somewhat darkened in very mature examples. Neuration less close; two or three sectors going from cubitus to hind margin . . . . . *risi*, Morton.

In the meantime, I cannot attempt to give anything like an outline of the geographical distribution of these insects. Practically the whole material dealt with has been drawn from Scotland, chiefly from Rannoch and Clydesdale. All three abound in Perthshire at the proper time, and I took all of them in Lanarkshire on April 9th and 10th, 1910. I have little hesitation in saying that they occur pretty generally throughout Scotland. No doubt they occur in many English localities.

For *T. risi*, Mr. Porritt gives the following localities: Harden Clough, near Huddersfield, and Dunford Bridge, both in South-western Yorkshire (Porritt); and Buckden in Wharfedale, North-western Yorkshire (Carter). Other localities are Haslemere, Surrey (July), River Yealm, at Cornwood (May 16th), both in McLachlan's collection; and Mr. Briggs records it as rare at Exeter, Bickleigh Vale (Bignell), and not uncommon on East Lyn River (April, Briggs).

*T. nebulosa*, according to Briggs, has been taken near Exeter (Parfitt), and at Exminster (March, Bignell); and Porritt has it from Pickering, East Yorkshire (February 1st).

The only species known from Ireland with certainty is *T. risi*,



which is common about rapid streams in Co. Wicklow in April (Halbert).

It may be useful to consider shortly some of the allied Continental forms. With this end in view I have made *camera lucida* sketches of the apex of the abdomen from above of several species. These figures are more or less diagrammatic. The figures of the ventral plate serve only to show its outline; no attempt has been made to represent fully the structures lying within the hollow of this plate. The form of the cerci is important and useful, but it appears that allowances must be made occasionally in respect of the position they happen to occupy in each preparation. The remarkable, strongly chitinized vesicle, called by Klapálek the supra-anal lobus (or *valvula supra-analis*), is a very striking feature, and the point of the dorsal appendage of this organ affords good specific characters [cf. Klapálek, "Geschlechtstheile der Plecopteren": 'Sitzungsber. der kais. akad. d. Wiss. in Wien, Mathem.-naturw. Classe,' Bd. cv. Abth. i. 1896, pp. 35-41, Taf. v. (named *T. trifasciata*, but refers to *braueri*)].

Comparing Klapálek's figures of the apex of the appendage of the supra-anal lobus of various species of *Tæniopteryx* ("Ueber neue und wenig bekannte Arten der Paläarktischen Neuropteroïden," p. 11: 'Bulletin internatl. de l'Académie des Sciences de Bohême,' 1901), *T. putata* is a little suggestive of *tristis*, Klap., but this species is evidently different, having only two sectors going from the cubitus to the hind margin. It is very unlikely that *putata* will prove to be restricted to Great Britain. Yet, with one exception, I have never seen anything like it from the Continent. The exception is represented by a pair of *Tæniopteryx* from Czarnohora, in the Eastern Carpathians, received from Mr. Josef Dziedzielewicz: ♂, March 5, ♀, March 15, 1909. These were sent under the name of *T. braueri*, but they do not belong to that species. The male has full wings, but in its structure it comes near *putata*. The female is in a rather curious condition, the apical marking of the fore wings being small, and the subapical crescent hardly indicated at all. It would be interesting to know whether this is an individual variation or normal for the locality. The small apical marking recalls *braueri*, but the facies of the insect is rather different. If I am right in supposing this insect to be *putata*, then the wing-markings are subject to wide fluctuation, and the characters drawn from Scottish specimens will not be universally applicable.\*

\* I have since received a second pair from the same source. In the female the markings are more normal; the free sectors of the cubitus in the fore wings are respectively two and three. In the male the sectors are two in both fore wings. This form is certainly close to *putata*. In the latter

The other European species of the restricted genus *Teniopteryx* known to me are as follow:—

*T. braueri*, Klap.—This species, like *putata*, has the antennæ distinctly moniliform. The male is, however, full winged. The female is very similar to *putata* female, but the apical marking of the fore wings in *braueri* is apparently always quite isolated. Klapálek states that *monilicornis*, Pict., is a condition of this species, in which the antennæ are strongly moniliform and the wings without any transverse markings. Probably *braueri* will prove to be a widely distributed species. I have seen it from Bohemia (March, Klapálek) and Spain (♂, Jan. 23, ♀, Feb. 11, Navás). Petersen records it from Denmark.

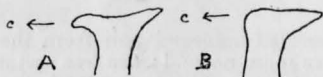
*T. trifasciata*, Pict. (Klapálek).—The male has distinctly moniliform antennæ; female, antennæ with cylindrical joints. The wings of the male are in a peculiar condition, the fore wing being only about half as long as the hind wing (cf. 'Die Süßwasserfauna Deutschlands (1909), Plecoptera,' by Klapálek, pp. 57-8, fig. 88). The male is known to me from a series from Vienna (March 31, 1899, Klapálek). The female I have not seen; Klapálek describes the wings as "mattgrau, die Spitze und 3 fast gerade Querstreifen dunkler."

*T. kempnyi*, Klap.—Antennæ setiform, with short joints (somewhat moniliform in the male) in the proximal fifth. Full winged in both sexes. In the female especially the bands are fairly well marked, but perhaps as a rule less conspicuous than in *putata* and *braueri*. Apical spot quite small and isolated. Known to me from Switzerland (Dietikon, March 16, Ris), and Lower Austria (Gutenstein, March and April, Kempny).

*T. seticornis*, Klap.—Antennæ as in *risi*, slender, with cylindrical joints longer than broad. Full winged in both sexes, the membrane being less grey-looking than in the other species; neurulation dark and distinct. Transverse markings small but very distinct; apical marking absent or just indicated by a darkening of the tip. The anal veins in the hind wing sometimes margined with grey, giving these wings a pretty radiate appearance. It is recorded by Klapálek from the Böhmerwald, Riesengebirge, Erzgebirge, and Harz (June and July), and I have received a male from the Eastern Pyrenees (Vernet-les-Bains, April 24-May 9, 1909, Dr. Chapman).

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the apex of the dorsal appendage of the supra-anal lobus, seen from side, projects strongly cephalad; this projection is hardly indicated in the Carpathian



male (fig. A, *putata*; B, male from Carpathians; c indicates the direction of the head).



It should be added that *T. nebulosa* and *T. risi* appear to be widely distributed in Continental Europe.

In connection with this paper I have to express my thanks to my ever-obliging friend, Dr. Fr. Ris, of Rheinau, who in the midst of much more important work kindly took the trouble to make preparations of a series of wings, and to photograph them. To British entomologists wishing to identify any specimens of *Taniopteryx* they may meet with, these wing-photographs cannot fail to prove most useful aids.

## EXPLANATION OF PLATES.

## PLATE II.

- Fig. 1.—*Taniopteryx trifasciata*. Pict. (Klap.), from Vienna.  
 ,, 2.—*T. braueri*, Klap., from Karlin, Prague, Bohemia.  
 ,, 3.—*T. putata*, Newman, from Scotland.  
 ,, 4.—*T. kempnysi*, Klap., from Dietikon, Switzerland.  
 ,, 5.—*T. risi*, Morton, from Scotland.

In each case, apex of abdomen of ♂ from above.

- \**a*. Apex of dorsal appendage of supra-anal lobus, from above, more enlarged. *5b*. One of the cerci of *T. risi*, from above (more enlarged), from another specimen.  
 ,, 6.—*T. nebulosa*, Linn., from Scotland; apex of abdomen of male from above.  
 ,, 7.—*T. nebulosa*, from Lower Austria; apical process of valvula sub-analis (?).

## PLATE III.

*Fore wings of Male*.—Fig. 1. *T. nebulosa* (micropterous form) (nat. length, 4·8 mm.). 2. *T. risi* (nat. length, 10·7 mm.). 3. *T. putata* (nat. length, 6·7 mm.).

*Fore wings of Female*.—Fig. 1. *T. nebulosa* (nat. length, 12·1 mm.). 2. *T. risi* (nat. length, 11·4 mm.). 3. *T. putata* (nat. length, 13·1 mm.).

\* “*a*” accidentally dropped from smaller fig. 5.

ON THE ECONOMY OF THE ICHNEUMONID  
*MONOBLASTUS PALUSTRIS*, ILLGR.

By RUPERT STENTON, F.E.S.

ON June 10th of last year a female was brought to me of the above Tryphonid, which had been observed by its captor to oviposit in a larva of *Emphytus cinctus*, L. On a supply of these sawfly larvæ being obtained—an easy matter, as they are a serious pest in this Herne Hill district to those possessing valued varieties of roses—and one of them being introduced to the ichneumon, parasitization almost instantly followed. This was effected close behind the head, the operation occupying a few seconds, the larva not making the slightest outward show of objection, though this was certainly exceptional I afterwards found, because a considerable number of larvæ were parasitized by this and another female of the same species during the next

ten days, and they did make what resistance they were capable of, by throwing themselves violently to and fro from side to side during the process of investigation by the ichneumons' antennæ and subsequent parasitization, and would often fall to the ground with the parasite attached, but it was all wholly ineffectual.

On an average about four larvæ were parasitized a day, but very likely more would have been had they been supplied, and no doubt it falls short of the number had the insects been at large.

From one cause or another I lost all my *Emphytus* larvæ in which ova had been deposited except one, parasitized on the day of the first ichneumon's capture. For some time prior to July 27th this larva had been lying quiescent as though dead, which no doubt it was, as on that day the parasitic larva emerged from it, leaving only the shrivelled skin, showing that it had occupied the whole of it. Ordinarily, no doubt, the sawfly larva would have entered a stem of some sort, containing pith, as is their habit, with the intention of pupating, but nothing of this nature was provided.

The *M. palustris* larva was cylindrical, the head and first segment and the two apical segments quite white, the intervening space being green from the interior parts of the creature showing through the skin. There was a very dark green line, bordered by white granules along the dorsal area, throughout the length of the green part, the lateral lines, ventro-lateral lines showing only in the segmental divisions, and a dark ventral line. I counted fourteen segments, including the cephalic one. There was a very slightly discreted border, not very evident. The mouth parts were discreted with fuscous and the antennal tubercles, large, concolorous, and not protruding beyond the level of the head.

The animal had begun to spin some strands of silk, evidently the commencement of its cocoon, presuming this to be a cocoon-spinning species, which it had every indication of being. But I removed it to figure the facial characters, and have found that to do this with larvæ of other species disorganizes them to the extent of incapacity to ever finish the cocoon, as was the case with this one, but it did not result in its ultimate demise as I expected.

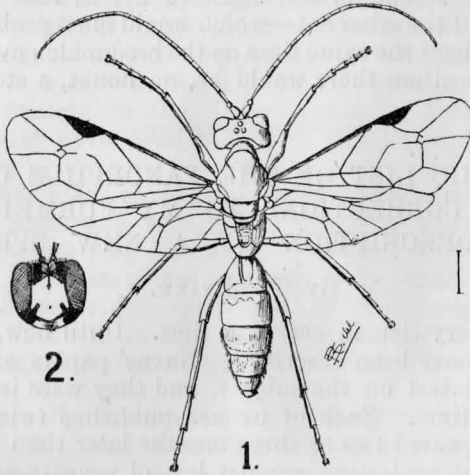
It was now placed in a glass tube, where it spun some silk at each end.

On August 1st signs of pupation began to show, a red spot appearing on each side under the skin of the second body-segment, the eyes of the imago forming, the next three segments showing the contraction for the thorax, now turned to yellowish, the rest white and taking on more of the future imaginal abdominal outline, the extreme apex being buried in a thick black fluid, the larval excreta.

By the morning of the next day there was some more development in outline towards pupation, which then took place. In the evening it had got clear of the black fluid.

Beyond a darkening of the eyes and ocelli there was no visible change until August 10th, when there was a slight clouding of the cheeks and whole thorax, of which the mesothorax and mesosternum were nearly black, as were two marks down the metanotum, and the mandibles red at the tips.

On the evening of August 11th the head, thorax, and coxæ were quite black, a black patch on the dorsal area of the two first abdominal segments, next two clear except two dots on each



1. *Monoblastus palustris*, Illgr., ♂. 2. Face.

ventrally, the rest clouded and marked with black only on the ventral surface (not clouded), with the legs commencing to show colour.

The next morning, August 12th, I found that during the night there had been a considerable darkening of colour all round, the dorsal surface of the third and fourth abdominal segments now being orange, legs more red, antennæ clouding, and mandibles darker.

The following evening, August 13th, there was an exudation of moisture and the pupal skin cast, except from the extreme anal end. By the evening of August 14th this was discarded altogether, and some whitish pellets of exuviae exerted, and in the morning, August 15th, the imago, a male, was running round the tube ready to emerge.

Though the economy of this species, as far as investigated, does not present any phenomena of more than usual interest, it is rarely that any glimpse of what takes place during the early

stages of an internal, presumably, cocoon-spinning parasite is afforded, and Mr. Claude Morley, who kindly determined my insects, has pointed out that as a British species *M. palustris* has up to now only been represented by a single known female in the British Museum, captured by the late Rev. T. A. Marshall at Bugbrooke, Northants.

It would probably be found not uncommonly in the gardens of Herne Hill and district, about the rose trees infested with the host, as five females were taken in addition to the male that was bred, and one female in August, 1909.

I might mention that on July 28th imagines of *Emphytus cinctus* of the second brood began to fly, so that by the time the parasites of the other sex—which would most probably appear in the open about the same time as the bred male emerged—were ready for oviposition there would be, no doubt, a stock of larvæ in readiness.

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A SYNONYMIC LIST OF THE PANORPIDÆ OF JAPAN,  
WITH CORRECTIONS TO MY FORMER PAPER,\*  
AND DESCRIPTION OF A NEW SPECIES.

By T. MIYAKE.

JAPAN is very rich in scorpion flies. Until now, more than forty species have been described. Navas' papers and mine are perhaps the latest on the subject, and they were issued almost at the same time. Each of us has published twice, and each time mine appeared two or three months later than his. I have no intention of protesting against law of priority as applied to zoological nomenclature, and there is not the least question that Navas' names should be adopted; but I must say that both of my papers were respectively ready for print over one year before they were issued, though their publication was delayed by circumstances which it is not necessary to detail here. This explains why the same species were described by me under names which are now to be relegated to the list of synonyms. The *brachypennis* of my first paper is a synonym of his *nipponensis*, as I mentioned in my second paper, and Mr. Navas in his. Again, in the last paper of Mr. Navas, some species are described which appear to stand very close to some of the species of my second paper, as, e. g., *Panorpa nævia*, Navas, to *Panorpodes apicalis*, Miyake, and *Panorpa limbata*, Navas, to *Panorpodes singularis*, Miyake. Of these, the last-mentioned species, though very closely allied, still appear to me distinct, unless further facts be brought to light, as there are a number of species of our Panorpidæ which are recognized as distinct just by such degrees

\* "A Further Contribution towards the Knowledge of the Panorpidæ of Japan," 'Journ. Coll. Agr. Imp. Univ. Tokyo,' vol. ii. No. 3 (1910).

of difference as are found in the above two species. *Nævia*, N., and *apicalis*, M., appear to me to be identical, and *apicalis* must be looked upon as a synonym of *nævia*. If this be the case, then it is very strange that the two species of Navas were put in the genus *Panorpa*. They belong undoubtedly to the genus *Panoropodes*, as may easily be seen from such characters as *short rostrum*, *simple claws*, and many others, and it is still more strange to me that Mr. Navas describes a new species of *Panoropodes* in the same paper.

I must here correct some errors in my last paper. My identifications of *Panorpa lewisi*, M'Lach., and *P. bicornuata*, M'Lach., were erroneous, and I now consider my *chuzenjiensis* as identical with the former, and *magnicauda* with the latter, so that these names should respectively be relegated to the list of synonyms. Again, in the key to the species, *cornigera* was placed by mistake in the *Aulops* group of Enderlein, and of course should have been placed in the *Panorpa* group of the same author.

Navas has made some remarks on *Bittacus sinense* of Matsu-mura and mine, and says, "Il y a lieu à douter si on a pris plusieurs espèces pour une seule." It may be so or may not be so, but at any rate I am making some investigations which I hope will settle the question. In the meanwhile, Navas' opinion is followed in this list. Anyhow, the species of our Panorpidæ already known need further examination as to their specific names.

The following list has been drawn up for preliminary purposes, and will probably need further correction. In the meantime, my own study is being continued:—

## PANORPA, Linn.

1. *Panorpa cornigera*, M'Lach., Bull. Soc. Ent. Suisse., 1887, p. 404.
2. *P. communis*, L., Matsumura, 'Senchuzukai' ('Thousand Insects of Japan'), vol. i., p. 164, pl. xi., fig. 6 (1904).
3. *P. gokensis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 193, pl. xi., fig. 3 (1910).
4. *P. gallvizi*, n. spec. (described p. 93).

## AULOPS, Enderl.

5. *Aulops japonica*, Thunb., Nov. Ins. Sp. Dissert., iii., p. 67, fig. 9 (1784); Westwood, Trans. Ent. Soc. Lond., vol. iv., p. 188 (1845); M'Lach., *op. cit.*, 1878, p. 183.
6. *A. leucoptera*, Uhl., Proc. Ac. Nat. Sci. Philad., 1858, p. 31; Trans. Ent. Soc. Lond., 1878, p. 186.
7. *A. ?* sp., Hagen, Stett. ent. Zeit., 1867, p. 90; *Panorpa hageni*, Navas, Rev. Russ. Ent., 1909, p. 4.
8. *A. macrogaster*, M'Lach., Trans. Ent. Soc. Lond., 1878, p. 184.
9. *A. klugi*, M'Lach., *l. c.*, p. 185.
10. *A. pryeri*, M'Lach., *l. c.*, p. 186; *Panorpa bouvieri*, Navas, Mem. R. Acad. Ci. Bar., vol. vi., No. 25, p. 20 (1908).

11. *A. wormaldi*, M'Lach., *l. c.*, p. 186; Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 202 (1910).
12. *A. levisi*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 402; *Panorpa chuzenjiensis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 201 (1910).
13. *A. bicornuata*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 403; *Panorpa magnicauda*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 192, pl. xi., fig. 6 (1910).
14. *A. nipponensis*, Navas, Mem. R. Acad. Ci. Bar. vol. vi., No. 25, p. 20 (1908); *Panorpa brachypennis*, Miyake, Bull. Coll. Agr. Imp. Univ. Tokyo, p. 9, pl. i., fig. 6 (1908).
15. *A. drouarti*, Navas, Mem. R. Acad. Ci. Bar., vol. vi., No. 25, p. 21 (1908).
16. *A. dyscola*, Navas, *l. c.*, p. 22.
17. *A. ochracea*, Miyake, Bull. Coll. Agr. Imp. Univ. Tokyo, p. 3, pl. i. fig. 9 (1908).
18. *A. sinanænsis*, Miyake, *l. c.*, p. 4, fig. 7.
19. *A. rectifasciata*, Miyake, *l. c.*, p. 5, fig. 10.
20. *A. striata*, Miyake, *l. c.*, p. 6, fig. 1.
21. *A. nipponensis*, Miyake, *l. c.*, p. 7, fig. 3.
22. *A. pulchra*, Miyake, *l. c.*, p. 8, fig. 4.
23. *A. trizonata*, Miyake, *l. c.*, p. 9, fig. 11.
24. *A. takenouchii*, Miyake, *l. c.*, p. 10, fig. 5.
25. *A. nikkænsis*, Miyake, *l. c.*, p. 11, fig. 2.
26. *A. ochraceopennis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 190, pl. xi., fig. 1 (1910).
27. *A. obscura*, Miyake, *l. c.*, p. 195, fig. 2.
28. *A. multifasciaria*, Miyake, *l. c.*, p. 196, fig. 5.
29. *A. irregularis*, Miyake, *l. c.*, p. 198, fig. 7.

## LEPTOPANORPA, M'Lach.

30. *Leptopanorpa ritsemæ*, M'Lach., Trans. Ent. Soc. Lond., 1875, p. 187.
31. *L. sieboldi*, M'Lach., *l. c.*, p. 188.

## PANORPODES, M'Lach.

32. *Panorpodes paradoxa*, M'Lach., *l. c.*, p. 189.
33. *P. decorata*, M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 405.
34. *P. nævia*, Navas, Rev. Russ. Ent., 1909, p. 1; *Panorpodes apicalis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 203, pl. xi., fig. 4 (1910).
35. *P. limbata*, Navas, Rev. Russ. Ent., No. 3, p. 2 (1909).
36. *P. notata*, Navas, *l. c.*
37. *P. singularis*, Miyake, Journ. Coll. Agr. Imp. Univ. Tokyo, vol. ii., No. 3, p. 204, pl. xi., fig. 7 (1910).

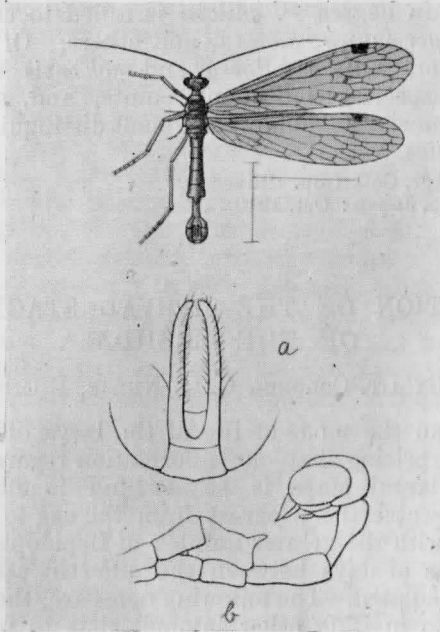
## BITTACUS, Latr.

38. *Bittacus sinense*, Walk., List Neur. Ins. Lond., 1853, p. 469; M'Lach., Bull. Soc. Ent. Suiss., 1887, p. 406; Matsumura, 'Senchuzukai,' vol. i., p. 165, pl. xi., fig. 5 (1904).
39. *B. nipponicus*, Navas, Rev. Russ. Ent., No. 3, p. 3 (1909).
40. *B. lævipes*, Navas, *l. c.*, p. 4 (1909).



*Panorpa galloisi*, n. sp. (*Futaten-shiriagemushi*.)

Subcosta of the fore wing extended to the pterostigma, as in *P. communis* and *P. cornigera*. Body blackish piceous; rostrum blackish piceous (slightly shorter than that of our other Panorpids), with the palpi piceous; legs testaceous. Wings rather broad (broadest at the pterostigmatal region), whitish with the fuscous veins, with the apex acutely elliptical; the only conspicuous markings (fuscous in colour) are of somewhat quadrate form in the fore



*Aulops galloisi*, n. sp., male.—a, Appendices; b, Apex of abdomen.

wing and of a triangular shape in the hind wing and are situated at the pterostigma, which is somewhat opaque, occupying its middle one-third; three very insignificant spots found in the fore wing placed obliquely from the pterostigma to the hind margin, the first situated at the middle of the wing and the last at the hind margin.

In the specimen (male) the posterior margin of the third abdominal segment is, so far as I can observe, formed like the other segments, and not produced into a median lobe, as in most of our Panorpids. The fifth and sixth segments stout and obconical, the latter is very conspicuous, and bears a short but prominent spine at the middle of the posterior margin; seventh slender, longer, and cylindrical; eighth much more slender and cylindrical and almost equal in length to the former; ninth (cheliferous segment) stout and rounded (not elongated, as in *P. japonica* and others), the chelæ

shorter than the segment; appendages long and almost parallel, except towards the end, where they slightly approach each other.

Length of body, 11 mm.; expanse of wing, 15 mm.

A male specimen captured at Chuzenji, Nikko, July 27th, 1910, by Mr. Gallois Edme, of the French Embassy.

As this species is new to science, I take great pleasure in naming it after my friend, an enthusiastic collector of Coleoptera, and captor of this specimen, who was so kind as to put the specimen at my disposal to be studied and described.

To a certain degree *P. galloisi* is allied to such European species as *P. germanica*, *annexa*, and others. Of the Japanese forms, however, only *cornigera* and *gokensis* are somewhat allied to the species; but many points, and, above all, the structure of the sixth abdominal segment distinguish it well from the other species.

Zool. Inst. Agr. Coll. Imp. University,  
Tokyo, Japan: Oct. 1910.

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## THE DURATION OF THE LARVAL STAGE IN SOME OF THE SESIIDÆ.

BY LT.-COLONEL C. G. NURSE, F.E.S.

CONSIDERING the mode of life of the larvæ of this family, it is scarcely surprising that our information regarding the duration of the larval stage is scanty and insufficient. It is impossible to watch the progress from the egg to the imago, as may be done with the greater number of Lepidoptera, where the actual number of days between the different ecdyses can frequently be calculated. The following notes are, therefore, offered with a view to inviting other entomologists to place on record their experience regarding the life-history of such species of this family as they are able to study.

The prevailing view appears to be, to quote South's 'Moths of the British Isles,' that "the majority, possibly all, are nearly two years in arriving at full growth." I have personally been able to study, very inadequately, four species, viz. *Trochilium apiforme* and *crabroniforme*, and *Sesia vespiformis* (*asiformis*) and *culiciformis*.

Of *T. apiforme* Barrett says, "full fed in April, after feeding probably nearly two years." This is not quite accurate, as the larva ceases feeding and spins its cocoon in September or October, though it does not change to a pupa until the following April, as noted by Greene in 'The Insect Hunter's Companion.' Of the total duration of the larval stage I cannot speak with certainty, but I think it reasonable to suppose that the life-cycle extends at least two years, and I should not be at all surprised



if it proved to be three years. The few specimens I have bred have all emerged in July, though Barrett gives the latter part of May and June as its period on the wing.

As regards *T. crabroniforme*; here again I cannot speak with certainty, but I have found the larva still feeding in June, and think it probable that the generally accepted opinion that it feeds nearly two years is correct.

My experience as regards *S. vespiformis* is very much more extensive, and I feel that I can state positively that this species, at any rate normally, completes its life-cycle in one year. As is well known, the larvæ are to be found under the bark of the stumps of felled oak-trees. These trees are invariably felled in the winter; the following summer the females of *S. vespiformis* frequent these stumps, especially those that produce a few shoots, though I have never been able to ascertain exactly where the egg is laid. Larvæ are to be obtained throughout the following winter and spring. To make this quite clear, I may say that the stumps of oaks felled in 1907-8 will, if the insect occurs in the neighbourhood, probably contain larvæ in the winter of 1908-9, and only in rare instances, when the stump is still alive, will a few larvæ be found in the winter of 1909-10. The larvæ seem of all sizes in April and May; indeed, I have found larvæ, pupæ, and imagines on the same day in June. When I first began to study this species, I thought that the smaller larvæ would probably only reach the imago stage in the following year. But the emergence of the imago extends over a long period, *viz.* from the end of May to the end of August. If a stump be searched, however, in the middle or end of July, no larvæ are to be found, only empty and a few full cocoons. I think, therefore, that I am justified in concluding that the life of this species, from ovum to imago, extends for only one year, and that when, in rare instances, larvæ are found in the winter of 1909-10, in the stump of an oak felled in 1907-8, they are the progeny of imagines that emerged in 1909. It is possible that, as with other species of Lepidoptera, a few pupæ, or even larvæ, may "lie over" till another year, but I am convinced that the normal period during which the larva feeds is just under one year. I may state that during the past five years I have taken over two hundred larvæ and pupæ of this species, and have purposely searched for them at different times, with a view to ascertaining the duration of the larval stage.

I have not had as extensive opportunities of investigation regarding *S. culiciformis* as with *S. vespiformis*. But the former species is to be found in the larval stage in the live stumps of birch the second spring after it has been cut, and not, so far as my experience goes, in the third spring; so I conclude that this species has also a one-year cycle.

Timworth Hall, Bury St. Edmunds: Feb. 12th, 1911.

CONTINENTAL NEUROPTERA, &c., TAKEN BY DR.  
T. A. CHAPMAN IN 1909 AND 1910.

BY W. J. LUCAS, B.A., F.E.S.

From time to time Dr. Chapman has been good enough to hand over to me a few neuropterous and other insects which he has obtained on his Continental trips. A list of those taken in 1909 and 1910 is here given. Species that are not British are marked with an asterisk. Mr. K. J. Morton has been good enough to assist me in naming them, and those insects in which he is more immediately interested are now in his cabinet.

AMELIE-LES-BAINS, APRIL 6TH-21ST, 1909, AND VERNET-LES-BAINS,  
APRIL 24TH TO MAY 9TH, 1909.

**Plecoptera.**

\**Teniopteryx seticornis*. Vernet.

*Nemoura* of the group of *marginata* apparently; one each from Amelie and Vernet respectively; both, unfortunately, were females.

**Neuroptera.**

*Hemerobius subnebulosus*. Amelie.

*Chrysopa aspersa*. Vernet.

\**Panorpa meridionalis*. Vernet.

**Trichoptera.**

*Hydropsyche pellucidula*. Amelie and Bagnial-sur-Mer.

*Philopotamus montanus*. Amelie and Vernet.

\**Rhyacophila persimilis*. Amelie.

\**Rhyacophila tristis*. Vernet.

SOUTH OF FRANCE AT VAL D'HERENS, &c. JULY AND AUGUST, 1909.

**Plecoptera.** Val d'Herens: July 10th-30th.

\**Dictyopteryx alpina*.

\**Dictyopteryx intricata*.

\**Teniopteryx neglecta*.

\**Nemoura sinuata*, and probably another species of the same genus, but all are females.

*Leuctra inermis*.

**Ephemeroptera.**

\**Ecdyurus helveticus*. One male, one female, Val d'Herens: July 10th-30th.

**Neuroptera.** Val d'Herens: July 10th-30th.

\**Raphidia flavipes*. Four females.

*Micromus paganus*. One.

\**Megalomus tortricoides*. Seven.

*Chrysopa perla*. Three.

*Panorpa germanica*. Three males.

\**Panorpa alpina*. One female.

**Trichoptera.**

- \**Drusus discolor*  
 \**Drusus chrysolus*  
 \**Drusus alpinus*  
 \**Drusus muelleri*  
 \**Drusus melanchætes*
- } Val d'Herens: July 10th-30th.
- \**Cryptothrix nebulicola*. Trelechant, Col de Montets: August 6th.  
 \**Potamorites biguttatus*. Val d'Herens: July 10th-30th.  
 \**Sericostoma pedemontanum*. One from Trelechant: August 6th.  
 Four from Val d'Herens: July 10th-30th.  
*Plectrocnemia conspersa*. One from Trelechant: August 6th.  
 One from Val d'Herens: July 10th-30th.  
 \**Rhyacophila vulgaris*. Val d'Herens: July 10th-30th.

HYÈRES, ST. MAXIME, BINN, AND HOSPENTHAL, APRIL TO JULY, 1910.

**Plecoptera.**

*Nemoura mortoni*. Three females, Hospenthal: July 12th-31st.

**Odonata.**

*Brachytron pratense*. One female, Hyères: April 5th-20th.  
*Pyrrosoma nymphula*. One male, one female, St. Maxime: April 29th-May 11th.

**Neuroptera.**

*Sialis lutaria*. Two, Hospenthal: July 12th-31st.  
*Raphidia notata*. One male, Binn: June 20th-30th.  
*Chrysopa vulgaris*. One, St. Maxime: April 29th-May 11th.

**Trichoptera.**

- \**Acrophylax zerberus*. A female, Binn: June 20th-30th.  
 \**Drusus alpinus*. Three females, Binn: June 20th-30th.  
 \**Drusus nigrescens*. A male and a female, Binn: June 20th-30th.  
 A male, Hospenthal: July 12th-31st.  
 \**Drusus melanchætes*. Two males and two females, Hospenthal:  
 July 12th-31st.  
 \**Lithax niger*. Seven, one of small size, Hospenthal: July 12th-31st (six of them marked "Gotthard").  
 \**Potamorites biguttatus*. Two males, Hospenthal: July 12th-31st.  
 \**Rhyacophila vulgaris*. A male, Binn: June 20th-30th. [There was also a \**Sericostoma* female (probably *galeatum*) from Le Canadel.]

Kingston-on-Thames: February, 1911.

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**ABERRATION OF *ACRONYCTA RUMICIS* AND *A. ALNI*.**

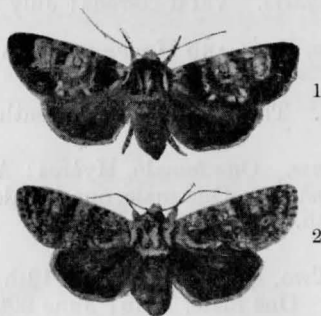
BY RICHARD SOUTH.

HERR M. GILLMER (Ent. Rec. xix. p. 91) describes an aberration of *Acronycta rumicis* as follows:—"It has the basal and marginal areas of the fore wings black, the middle area scarcely darker brownish-grey than in typical specimens; the outer, light, transverse lines obsolete (or suppressed), only the white mark

in cell 1*b* (anal cell) remains; otherwise the insect is typical = ab. *suhrianna*, n. ab. This form is intermediate between the brownish-grey type and the quite black form of ab. *salicis*, Curtis. The specimen is a female, and caught in the Palatinate."

In 'Societas Entomologica,' xxiv. p. 59 (1909), Herr Gillmer figures ab. *suhrianna*, and quotes the original description, with a translation thereof in German. In a footnote it is pointed out that the outer transverse line is not so conspicuous as it appears to be in the figure.

A year or two ago Mr. T. Baxter, of St. Anne's-on-Sea, Lancashire, was good enough to send me a photograph (here re-



ACRONYCTA RUMICIS.—1, aberration; 2, normal.

produced) of an aberrant specimen of *A. rumicis* that he had found on the golf-links in his neighbourhood on July 4th, 1905.

This interesting example seems to be referable to ab. *suhrianna* as described above. The only apparent difference is that, whereas the basal area in *suhrianna* is stated to be black, this area in the Lancashire specimen is traversed by a broad black band which occupies only the outer two-thirds, the basal third of the area being pretty much as in normal specimens. In the figure of *suhrianna* the basal area does not show wholly black right up to the thorax.

In his note, "Captures at Sugar in Yorkshire" (Entom. xliii. p. 228), Mr. Bunce refers to one of the three specimens of *Acronycta alni* as "strongly inclined to melanism." I lately had an opportunity of seeing this specimen, and found it to be an unusual (British) aberration of *A. alni*, closely approaching ab. *steinerti*, Caspari. It may be briefly described as follows:—Head and thorax blackish, the former narrowly edged with greyish, the latter with a few greyish hairs. Fore wings brownish grey, suffused with smoky; black markings as in the type, but the antemedial black line is rather broader; postmedial and submarginal lines a paler shade of the ground colour, the former narrowly edged externally with black; orbicular stigma of the ground colour with black centre and outline; reniform black

with faint outline of ground colour, mixed, in upper portions, with black.

According to Staudinger (Cat. Lep. 1901, vol. i. p. 132, No. 1082), figures of *steinerti*, Caspari, described in 1898 ('Societas Entomologica,' xiii. p. 3), are given—Jahrb. Nass. lii. pl. 4, figs. 8, 9; 'Iris,' xi. pl. 2, fig. 5; as *carola*, Phillips, Jahrb. Nass. lii. pl. 4, figs. 5-7; and as *alni* var. by Barrett, Brit. Lep. iii. pl. 121, figs. 1a, 1b. The last two seem to be modifications of *steinerti*, as also is the specimen secured by Mr. Bunce. The latter, however, appears more heavily suffused than either of the others.

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### HYBERNATION OF *PYRAMEIS (VANESSA) ATALANTA* IN CAPTIVITY.

BY L. W. NEWMAN.

IN the autumn of 1909 I saved seven specimens of *Pyrameis (Vanessa) atalanta* to see if it were possible to hibernate them in England under unnatural conditions.

I have many times tried them out of doors, also in a cold greenhouse, but in both cases failed, the specimens dying off early in the winter.

I prepared a small cardboard box about nine inches by six inches by six inches deep, cut out the lid, leaving only the frame of cardboard, stretched open mosquito netting over the box, and held this down with the cardboard frame.

The butterflies were placed in this, the box stood by a window facing east, and at night removed to a warmer quarter of the room; there was always a fire in the room, and also a large boiler which was warm all night, so that the specimens never had a lower temperature than, say, 35 degrees, even on the coldest nights. After two or three days they became very restless, and evidently required food. A good-sized pad of absorbent cotton-wool was well soaked in water, sprinkled with cane-sugar, and placed in the centre of the box on top of the mosquito netting; very soon the butterflies had found the sweets and were busy feeding. They walked about in the box, continuously opening their wings when the sun was shining, and about midday retired to the darkest corner of the box.

Throughout the whole winter they fed regularly every few days, and on no day when there was any sun did they remain quiet, no matter how cold the weather was out of doors.

The first casualty happened in December, when a male specimen became quite paralyzed; he seemed to have indulged too freely in food, for his body became very distended, and he lay for many hours at the bottom of the box with legs twitching and wings quivering before he died.

In January the specimens became very tame, and it was my habit to let them fly about in my room on sunny mornings; they would settle on the curtains with wings expanded and sun themselves; they would also feed from my hand, and enjoyed a piece of apple with sugar sprinkled on it, or a banana; they seemed to like the extra space, and the exercise I thought would keep them strong, as they took so much food.

In February I lost a second specimen, which flew into the fire; this left me with only five. All went well, and no more met with unhappy endings during that month.

Early in March I placed them out of doors in the daytime, confined in a roomy cage under a glass-roofed house with open sides, and gave them a pot of growing nettle. No sign of pairing was noted, but in early May a fair quantity of ova had been deposited; these, however, proved infertile, and on examining the specimens I found all were females, the only two males having been the victims of the winter; this greatly disappointed me.

The last specimen lived till the end of May.

I think these observations clear up a point which has long been in doubt, and prove that *atalanta* is not a true hibernator, as it requires food all the winter, consequently this species very seldom, if ever, passes the winter as imagines in England; we are, therefore, entirely dependent on immigration every year for this beautiful though common butterfly.

1910 was a very bad *atalanta* year. Personally, I saw only two specimens on the wing and found but one larva, and heard of very few larvæ or imagines having been seen in England during the year.

I had six pupæ sent to me from Devonshire; these I bred out, and have the imagines alive. Mr. T. Reuss has sent me eight living specimens, two of which met with an accident a few days after arrival, so this winter I have twelve specimens, and with these few I hope to be able to clear up a further point next spring, and that is, to find out whether the species pair in early spring. I have noticed no sign of autumnal pairing.

Bexley, Kent.

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## THE HUMBLE-BEES OF FORMOSA.

By T. D. A. COCKERELL.

HAVING received from the British and Berlin Museums a large series of Formosan *Bombi*, I have thought it opportune to present an account of the species of that island, all of which appear to be endemic.

*Bombus wilemani*, n. sp.

Worker; length 15 mm.; black, the pubescence black, rust-red on abdominal segments 3 to 6, above and below; the small joints of



the tarsi also have reddish hair, and it is ferruginous on the inner sides of the middle and hind basitarsi, except the base of the former; head elongate, malar space longer than broad; eyes dark greenish; nodules of labrum low; fourth antennal joint very short, broader than long, not quite half length of third; ocelli small; tegulæ dark brown; wings pale reddish, the apical margin not conspicuously darker; nervures relatively slender, ferruginous; second and third abdominal segments with a few pale hairs in the middle.

Female; length 21 mm., width of abdomen 8; otherwise similar to the worker.

*Hab.* Formosa (A. E. Wileman). British Museum. This species is closely related, both in structure and colour, to *B. pomorum* of Europe. It is also related to the Formosan *B. bicoloratus*, but is smaller, with much more delicate venation. The similar-looking Japanese *B. andreae*, Friese, is related to *B. pratorum*, and therefore structurally distinct from *B. wilemani*. I have taken the worker, *B. wilemani*, as the type, since the female is in bad condition. Both specimens bear a written label, "Arizan, ix. 11, 1906, 7500 feet," and a printed one, "Tainan, Anping, S. Formosa."

*Bombus bicoloratus*, Smith, 1879.

From the Berlin Museum I have two females, four hermaphrodites, collected by Sauter in Formosa. Two of the workers are labelled "Kanshirei, 8. 6. 08."

*Bombus bicoloratus* var. *fulvolateralis*, n. var.

Worker; meospleura with the hair pale brown instead of black. Three collected by Sauter in Formosa; two are from "Kanshirei, 8. 6. 08." Berlin Museum.

*Bombus latissimus*, Friese, 1910.

This very fine species has only lately been described. A female from the British Museum was collected by Wileman at the same place as the types of *B. wilemani*, but on September 27th. From the Berlin Museum come one female and eleven workers collected by Sauter. One of the workers has red hair on each side of the first abdominal segment posteriorly. Only one Sauterian specimen has the exact locality specified; a worker from Chip Chip, S. Formosa, February, 1909. At first sight it might seem that *latissimus* was only a variety of *B. bicoloratus*, but it is certainly a distinct species, differing in its broader abdomen, the abundant red hair of legs, the apical dark band of anterior wings with its inner margin fairly straight (in *bicoloratus* it is conspicuously undulated or lobed), and in having the fourth antennal joint much longer than broad (in *bicoloratus* the fourth joint is short, hardly or not longer than broad).

A female of the Japanese *Megachile doederleinii*, Friese, was taken by Mr. Wileman in Formosa, and bears the label,

“Kozensho, Ko-tan-kgan, 6000 ft., ix. 7, 1096.” It is about 21 mm. long—distinctly smaller than a Japanese example in my collection. I suspect that this species has been introduced into Formosa, as it is wholly absent from the large collection made by Sauter. There is in the Sauter collection a related species with much shorter mandibles.

## CHESHIRE AND SOUTH LANCASHIRE ODONATA.

By W. J. LUCAS, B.A., F.E.S.

RECENTLY I have seen a collection of dragonflies from Warrington, some belonging to the Municipal Museum, the remainder from Mr. G. A. Dunlop's collection. I record such of the local ones as bear date and locality labels.

*Leucorrhinia dubia*. Abbot's Moss, Cheshire: July 4th, 1908; July 2nd, 1909; August 1st, 1910.

*Sympetrum flaveolum*. A male, Flaxmere: August 5th, 1907.

*Sympetrum scoticum*. Flaxmere, Cheshire: August 5th, 1907; August 3rd, 1908. Abbot's Moss: July 4th, 1908; August 1st, 1910.

*Calopteryx virgo*. Amongst a number of *C. virgo* and *C. splendens*, usually without labels, is a specimen of the former species, which appears to be var. *anceps*. Whether this is a North Country specimen I cannot say.

*Lestes sponsa*. Abbot's Moss: July 4th, 1908; August 1st, 1910.

*Pyrrhosoma nymphula*. Frodsham, Cheshire: June 9th–10th, 1902; July 18th, 1908; June 22nd, 1910.

*Ischnura elegans*. Flaxmere: August 5th, 1907. Padgate, South Lancashire: June 16th, 1909. A specimen bred out in the Museum; May 18th, 1909.

*Agrion pulchellum*. Frodsham: June 9th–10th, 1902.

*Agrion puella*. Frodsham: June 10th, 1902. Grappenhall, Cheshire: June 23rd, 1906. Padgate: June 16th, 1909.

*Enallagma cyathigerum*. Abbot's Moss: July 4th, 1908.

Perhaps the most interesting specimen is *S. flaveolum*, but being a male it is most probably a migrant. Mr. Dunlop will no doubt be able to satisfy himself as to whether it breeds in the Delamere Forest District or not. In the collection are two specimens of *Agrion pulchellum*, labelled “New Forest, 9 July, 1895.” This species has not, I believe, been recorded for the New Forest, and the record would have been of interest; but, unfortunately, the specimens were bought at Stevens', and nothing further is known about them. Mr. Dunlop tells me in addition that *Æschna grandis* and *Æ. cyanea* occur very commonly in the district, even flying about the streets of Warrington, and that *Agrion puella* is common on the Old Quay Canal, Acton Grange, Cheshire.

Kingston-on-Thames: February, 1911.



HATCHING OF THE EGGS OF *ARGYNNIS LAODICE*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

IN the 'Entomologist' for March, 1909, I published an account of the life-history of *Argynnis laodice*, wherein I stated that the larvæ remain developed within the egg throughout the winter and emerge therefrom in the early spring. This statement M. Gillmer contradicts in his review ('Societas Entomologica,' xxiv. nos. 4-5) of the life-history, maintaining that the larvæ in a state of nature emerge from the eggs in the autumn. Subsequently I pointed out in the 'Entomologist,' October, 1909, p. 258, that I felt convinced M. Gillmer was wrong in his assertion, and that if any eggs emerged in the autumn this was due to the fact that the eggs in question were kept more or less under artificial conditions.

The Hon. N. Charles Rothschild, to whom I am indebted for the original eggs, now kindly tells me that he has received more than one hundred eggs of *A. laodice* during January of this year, from M. Kieselbach (living in Koenigsberg, where this butterfly is common), who has informed him that, out of a number of eggs deposited by a single female *laodice*, some hatched in the autumn, while others passed through the winter in the egg state, the young larvæ only making their egress from the shell in the spring. He further states that, in his opinion, the larvæ that emerge in the autumn are induced to adopt that course when kept under artificial conditions, although exposed to the cold; he also seems more or less convinced that in a state of nature the larvæ do not emerge from the eggs until the spring.

By this statement M. Kieselbach's opinion exactly coincides with my own.

It may be noted that *A. laodice* very closely resembles *A. paphia* in all stages of the larva, and the pupæ of both are so similar that they are almost indistinguishable. But the eggs of the two species differ: that of *laodice* bears a close resemblance to the egg of *A. adippe* in form and general structure, as well as the period of hatching. The latter are laid during July and August, and hatch about the beginning of the following April, while the eggs of *A. paphia* remain only about fifteen days in the egg state, hatching during August, when the young larvæ immediately enter into hibernation, without feeding on anything more than that portion of the eggshell which they eat away to allow of their emergence; they simply rest near the empty shell until the following spring, usually awakening at the end of March or early in April.

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## RHYNCHOTA INDICA (HETEROPTERA).

By W. L. DISTANT.

Fam. PENTATOMIDÆ.

*Elasmucha tauriformis*, sp. n.

Olivaceous-brown, the corium more olivaceous, the membrane pale olivaceous-brown; head sparsely coarsely punctate, the lateral margins sinuate, the lobes subequal in length, the central lobe almost impunctate; antennæ piceous, basal joint not reaching apex of head, second and third subequal in length, each much longer than first, remaining joints mutilated in type; pronotum rather sparingly but very coarsely punctate, the punctures somewhat confluent near anterior margin, the lateral angles longly, robustly, transversely produced, their apices finely, acutely narrowed, the posterior angles distinctly, rather broadly posteriorly produced; scutellum sparingly, coarsely punctured; corium very obscurely finely punctate; membrane not passing the abdominal apex; head beneath and sternum olivaceous-brown, sparingly, coarsely punctate, mesosternal process not reaching the anterior margin of the prosternum and backwardly produced between the intermediate coxæ; abdomen beneath greenish-olivaceous, abdominal spine almost reaching the intermediate coxæ, an obscure central longitudinal ridge, angles of the posterior segment broadly subprominent, rostrum about reaching the posterior coxæ. Long.  $9\frac{1}{2}$  mill. Exp. pronot. angl. 8 millim.

*Hab.* Punjab; Murree.

The longly and apically spinously produced lateral angles of the pronotum is a distinctive feature of this species.

*Elasmucha montandoni*, sp. n.

Ochraceous, coarsely darkly punctate; produced pronotal angles carmine-red; scutellum with a large basal central oblong black spot; head coarsely punctate, the lateral margins almost impunctate; antennæ mutilated in typical specimen; pronotum coarsely punctate, the punctures somewhat confluent near anterior margin, lateral margins almost impunctate, a few punctures in linear series on their anterior areas, the lateral angles produced and apically recurved, their apices shortly subacute, posterior angles distinctly but shortly and obtusely backwardly produced; scutellum sparingly punctate, more thickly so on lateral margins, about apical fourth distinctly narrowed; corium coarsely punctate; membrane slightly passing the abdominal apex; body beneath ochraceous; prosternum more or less coarsely darkly punctate; mesosternal process not reaching the anterior margin of the prosternum; abdomen with a transverse reddish-brown streak on each side of the fourth and fifth segments, two pale levigate ochraceous streaks on each side of the sixth segment, spiracles piceous; posterior angles of the anal segment in female moderately produced, curved, and carmine-red; abdominal spine scarcely passing the posterior coxæ; rostrum shortly passing the posterior coxæ. Long. 7 millim. Exp. pronot. angl.  $4\frac{1}{2}$  millim.

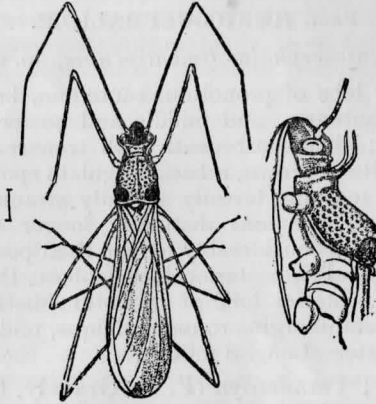
*Hab.* Bengal; Kurseong.

Dr. Montandon sent me a single specimen of this beautiful species.

Fam. BERYTIDÆ.

*Metacanthus bihamatus*, Dist., Ann. Soc. Ent. Belg. liii.  
p. 360 (1909).

Hab. Ceylon.



METACANTHUS BIHAMATUS.

I take the present opportunity to figure this species. By the long hooked spines to the pronotum it is somewhat aberrant to the genus.

Gen. TAPROBANUS (*ante*, p. 24).

Although carefully shown in the sectional figure of the typical species (*ante*, p. 25), the generic diagnosis did not refer to the character of a curved, upwardly directed, slender process on each side of the sternum between the intermediate and posterior coxæ.

Fam. LYGÆIDÆ.

*Macropes rufipes*, sp. n.

Head, pronotum, and scutellum black; corium ochraceous, more or less streaked with piceous; membrane very pale ochraceous with the veins darker; body beneath black, the legs reddish-ochraceous; antennæ black, the first, second, and third joints more or less ochraceous, the apices of the second and third joints distinctly clavate and black at apices; pronotum broadly distinctly transversely impressed a little before base, before this a little convex and irregularly impressed, the lateral margins moderately rounded, the basal margin moderately concave, the whole very finely punctate; membrane extending to a little beyond the middle of the abdomen; connexivum dull ochraceous; abdomen above black, finely ochraceously pilose; body beneath black, very finely ochraceously pilose. Long. 7 to 8 millim.

*Hab.* Bengal ; Kurseong.

Allied to *M. punctatus*, Walk., but differing by the pronotum being less deeply concave at posterior margin ; the second and third joints of antennæ distinctly clavate at apices ; different colour of the legs, &c.

I am again indebted to Dr. Montandon for specimens of this species.

Fam. HENICOCEPHALIDÆ.

*Henicocephalus limbatipennis*, sp. n.

Head, anterior lobe of pronotum, scutellum, body beneath, and legs ochraceous ; antennæ, and middle and posterior lobes of pronotum, castaneous ; abdomen beneath with transverse fuscous markings ; hemelytra pitchy-brown, a basal angulate spot ochraceous, the lateral and apical margins broadly sordidly stramineous ; antennæ distinctly pilose, second joint distinctly longer than the third ; anterior lobe of head considerably longer than posterior lobe, elongate, margins subparallel, posterior lobe globose, the ocelli near its anterior margins ; posterior lobe of pronotum distinctly wider than middle lobe, its lateral margins roundly oblique, middle lobe centrally longitudinally sulcate. Long. 8 millim.

*Hab.* Ceylon ; Peradeniya (F. H. Gravely, Ind. Mus.).

Mr. Gravely found this species "running about on the ground in the jungle."

Allied to *H. majusculus*, Dist., but a smaller species, differently coloured, the pale lateral margin to the hemelytra broader and regularly continued to the apex, basal joint of antennæ shorter and more incrassate, middle lobe of pronotum with the lateral margins rounded, not obliquely narrowed anteriorly, &c.

Fam. REDUVIIDÆ.

*Acanthaspis chilawensis*, sp. n.

Black ; antenniferous tubercles, spines at base of pronotum, basal angles and a large spot behind middle of corium, and lateral marginal spots to abdomen above and beneath, ochraceous ; legs pitchy-brown ; first joint of antennæ about as long as head ; anterior lobe of pronotum sculptured, the anterior angles subprominent, posterior lobe closely rugose, lateral spines somewhat long, a little directed backward, their apices black, the two central basal spines much shorter, posteriorly directed ; scutellum with a long spine obliquely directed backward ; legs finely setose ; rostrum reaching the anterior coxæ, first and second joints subequal in length. Long. 16 to 20 millim.

*Hab.* Ceylon ; Chilaw (E. E. Green).

Closely allied to *A. quinquespinosa*, Fabr., but basal central spines to pronotum smaller, their basal areas black, not ochraceous, spot to corium larger, less transverse, and more oblong, &c.

## Genus AMULIUS.

*Amulius viscus*, sp. n.

Head and antennæ black, the latter with the base of third joint (rather broadly) and base of fourth joint (narrowly) ochraceous; pronotum pale sanguineous, the anterior angles, some central suffusions to anterior lobe and the posterior lobe—excluding lateral areas—black; scutellum and corium black, apex of the former and a spot on apical area of the latter, ochraceous; membrane shining bluish-black; connexivum black with large pale sanguineous spots; a central longitudinal fascia to head beneath, ochraceous; sternum pale sanguineous, disks of meso- and metasterna and lateral areas of the latter, black; four spots near anterior margin of mesosternum ochraceous; abdomen beneath dull ochraceous, connexivum as above and a series of large sublateral spots black; legs ochraceous or pale sanguineous, a broad central annulation and apex to anterior tibiæ, apical areas of intermediate and posterior femora, the intermediate and posterior tibiæ and all the tarsi, black; rostrum black, about or almost reaching base of head; antennæ with the first joint less than half the length of head, second nearly as long as pronotum, third longer than fourth; anterior angles of pronotum long, spinously produced, the spines forwardly produced, curved, and slightly longer than first joint of antennæ, basal pronotal margin posteriorly laminately produced and strongly centrally emarginate; apex of scutellum somewhat tuberculous. Long. 19 millim.

*Hab.* Ceylon; Ratnapura (E. E. Green).

Allied to the Malayan *A. quadripunctatus*, Stål, but the anterior spinous pronotal angles black, much more slender, acute, and curved, &c.

"In life—has the anterior tarsi covered with a viscid secretion resembling Canada balsam. In living examples the red areas are quite brilliant" (E. E. Green *in litt.*).

## Fam. NOTONECTIDÆ.

*Anisops ali*, sp. n.

Ochraceous, the hemelytra more or less shaded with fuliginous; eyes black; interocular space narrow, margins parallel, not or very slightly narrowing at base, above with a distinct central longitudinal impression, the margins of which are ridged, beneath narrow, parallel, of the same breadth throughout; pronotum with a distinct waved carinate line on the anterior area, commencing on the lateral margins behind eyes and then roundly directed upward and united between the inner posterior angles of the eyes; abdomen beneath fuscous. This species is allied in general coloration to *A. sardea*, Herr.-Schaff., and *A. fieberi*, Kirk. From both of these, however, it is distinctly separated by the narrow parallel interocular space, and by the distinct carinate waved line to the pronotum. Long. 5 to 6½ millim.

*Hab.* Ceylon; Diyatalawa (E. E. Green).



## NOTES BY THE WAY.

THE restriction of the terms "type" and "co-type" to definite limits is an exceedingly simple matter, if we could but agree as to the limits. A world-wide authority in his particular order startled me to-day by stating that "co-type" could be applied to any specimen pronounced by the original describer to be co-specific with the type—that, in fact, you sent him a specimen, captured years after the description was published, he compared it with the type, returned it to you as co-specific, and you became, in consequence, the happy possessor of a "co-type"! Even "type" has a vague meaning for some authors. Two "types," both so labelled similarly by the author, were sold to a museum; one was from Ceylon, and the other from Kuching; his description gave "Kuching" as the only original locality—the sale of the Ceylon specimen as a type was, to say the least, irregular. "Co-types" are all the specimens of a single species immediately before the author when he draws up his description. The "type" is a single specimen selected at will by the author as most typical of this whole series of individuals.

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A nice point of synonymy was raised recently, for which we have no recollection of provision by the British Association or Zoological Congress:—If an author publish a specific name already figuring in the same genus, and a second man subsequently publish a description of the same species and make for it a new and valid genus, does the first name, which is not truly co-specific with the other species as placed, take priority in the second author's new genus?

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In our last we mentioned Irish entomological research; but a much more elaborate exploration has been going on respecting the insects of that very interesting group of islands off Madagascar known as the Seychelles. Prof. Stanley Gardiner, well known for his investigations in the Maldivé and Laccadive Islands, will shortly publish a detailed description of them, but we have already arrived at the third volume of the general account of the fauna collected there during 1908 and 1909 by Mr. Hugh Scott, the Curator at Cambridge. This is given through the medium of the *Trans. Linn. Soc.* of last November, and graphically introduces us to the sterile granitic rocks, rising in places to an altitude of two to three thousand feet. It is a most fascinating locality, since "there are well-marked distinctions between the entomological faunas of different parts," many species are obviously introduced, and there is a distinct Oriental element; forests at an elevation of some thousand feet were found most productive of truly indigenous species.

C. M.

## NEW LEPIDOPTERA-HETEROCERA FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

(Continued from p. 62.)

*Mithuna arizana*, sp. n.

♂. Antennæ fasciculate; head and thorax pale brown, abdomen paler. Fore wings pale brown, darker freckled; medial line dark brown, slightly oblique, interrupted above the middle; submarginal line dark brown, rather broad, much interrupted. Hind wings fuscous, outer margin and fringes yellowish.

♀. Similar to the male, but the medial line of fore wings is entire; hind wings paler than those of the male.

Expanse, 24 millim.

Collection number, 694.

One example of each sex from Arizan (7500 ft.). The male captured in September, 1906, and the female in August, 1908.

*ab. parva*, nov.

Smaller, the medial line of fore wings only distinct on the costa and the inner margin; the submarginal line less distinct and nearer the outer margin.

Expanse, 18-19 millim.

Two male specimens from Kanshirei (1000 ft.), June 13th, 1906.

Possibly these insects may be local forms of *M. quadriplaga*, Moore.

*Ilema tricolor*, sp. n.

Fore wings pale cinnamon-brown on basal two-thirds, blackish on outer third. Hind wings creamy white, a blackish border on the outer margin; the latter is broadest towards costa, slightly indented below middle, and narrowed at anal angle. Under side as above, but the basal two-thirds of fore wings creamy white, and the costal margins of all the wings streaked with yellow.

Expanse, 28 millim.

Collection number, 542 a.

One male specimen from Rantaizan (7500 ft.), May 13, 1909.

*Siccia taiwana*, sp. n.

Head and thorax white, faintly tinged with brown. Fore wings white, powdered with pale brownish chiefly on costal area; a black point near base of costa and a black mark below it; three blackish spots on the costa, from the first are traces of an antemedial line, and from the third a curved series of dusky dots (the second from inner margin bar-like) represent a postmedial line; a blackish spot at end of cell, and a dot about middle of cell; submarginal line dusky, slender, with blackish dots upon it; a blackish dot on the whitish fringes at apex, and a similar one about middle. Hind wings pale fuscous. Under side whitish; fore wings clouded with fuscous; hind wings with blackish discoidal dot and a dusky band beyond.

Expanse, 22 millim.

Collection number, 678.

One male specimen from Kanshirei (1000 ft.), August 19, 1905.

*Nudaria (?) semilutea*, sp. n.

Fore wings white; basal area, except extreme base, orange-yellow, limited by a partly curved line of the ground colour; the outer area clouded with dark brown. Hind wings whitish, faintly tinged with yellow; a dark cloud on outer margin towards the costa.

Expanse, 16 millim.

Collection number, 699.

One male specimen from Kanshirei (1000 ft.), June, 1906.

*Chamaita hirta*, sp. n.

♂. White, semi-transparent, the veins of fore wings clothed with brownish hairs, except on outer third (perhaps denuded).

♀. Whitish, semi-transparent, obscurely mottled with brownish (? stain).

Expanse, ♂ 18 millim., ♀ 18-20 millim.

Collection number, 681.

One example of each sex from Kanshirei (1000 ft.), May, 1906, and a female specimen, from the same locality, taken in August of that year.

Near *C. nympha*, Moore.

*Hyposiccia dentata*, sp. n.

Head and thorax dark brown, abdomen paler. Fore wings whitish, suffused with pale brown; basal third dark brown, hardly separate from a dark brown, dentate, antemedial line; medial and postmedial lines dark brown, dentate, space enclosed by the lines suffused with the darker colour; a black curved spot at end of cell, where the medial line is bent outwards, and a dot in the cell; submarginal line dark brown, interrupted, broadest towards costa; fringes whitish, preceded by a series of dark brown dots. Hind wings fuscous, fringes paler. Under side fuscous, costal and outer margins of fore wings and fringes of all wings paler.

Expanse, 18 millim.

Collection number, 698.

One male specimen from Tainan (on the plains), May 14, 1906.

Near *H. mesozonata*, Hampson.

*Asura limbata*, sp. n.

♂. Antennæ whitish above, reddish beneath; head and thorax white, the latter marked with brownish. Fore wings brownish, a black dot at end of cell, from which a black streak runs towards base of the wing; a subbasal line runs to a white streak on the inner margin, thence turns upward, forming a white hook-like mark; outer margin with white border, enclosing three brownish spots on the upper portion. Hind wings paler, with an interrupted white border on the outer margin.

♀. Paler, but this is probably due to its worn condition.

Expanse, ♂ 22 millim., ♀ 24 millim.



Collection number, 695 a.

One specimen of each sex from Kanshirei (1000 ft.). The male captured in April, 1907, and the female in May, 1908.

*Asura pica*, sp. n.

♀. Fore wings blackish with a white hook-like mark as in *limbata*, but the streak is more oblique to inner margin, and is twice interrupted near the costa; the white outer border of *limbata* is here represented by four white spots—one on the costa before apex, one at apex, one at middle, and one at the inner angle; all four united by a slender, wavy, submarginal white line. Hind wings blackish.

Expanse, 18 millim.

Collection number, 695.

One female specimen from Kanshirei (1000 ft.), September 22nd, 1906.

May be a seasonal form of *A. limbata*.

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NOTES AND OBSERVATIONS.

HYDRILLA PALUSTRIS, &c., AT WICKEN.—Though it is, perhaps, rather late in the day to tell of last summer's captures, it may be well to record that I was fortunate enough during a visit to Wicken in June to take two male specimens of *Hydrilla palustris*. I believe four other specimens were taken about the same time by other collectors. Considering the amount of wind, oftentimes from the east, we had during our stay of nearly three weeks, my friend (the Rev. J. W. Metcalfe, of Ottery St. Mary) and I did fairly well. *Arsilache albovenosa* was not much in evidence, but I had never on my two previous visits seen so many *Macrogaster castaneæ (arundinis)* on the sheet, or such abundance of *Meliana flammea*. Four hard days' work at Tuddenham produced only about two dozen *Acidalia rubiginata* between us; *Lithostege griseata* was almost over, but *Agrophila trabealis* was plentiful. In exploring for *L. griseata* we came upon a fresh locality for *A. trabealis* which promised well, but the presence of an irate farmer who would not listen to reason made future visits undesirable. The pine trees at Tuddenham are well-known as the resting place of *Hecatera serena*, but our experience was that the trees were quite deserted for the flowers of the viper's bugloss (*Echium vulgare*) which was growing in great profusion on the hillside. I took an entirely new series from the flowers, the moths settling quietly in brilliant sunshine. The Rev. J. W. Metcalfe was fortunate enough to take a specimen of *Dianthæcia irregularis* in the same way. The weather was fine during the whole of our stay except for one night when a thunderstorm was imminent, so much so as to drive us home in haste, only to find that it had left Wicken practically untouched in its course, and to have the mortification of knowing the next morning that the previous night had been entomologically the night of the season. The continuance of wind, however, was a serious disadvantage.—Rev. J. E. TARBAT; Fareham, Hants.

UNUSUAL EMERGENCE OF *NOCTUA PLECTA*.—On February 7th I found a perfectly fine specimen of *Noctua plecta* in the vestry of the church. The larva had probably pupated in the vestry in the autumn, and the warmth of the church had caused the imago to emerge at this early date.—Rev. J. E. TARBAT; Fareham, Hants.

UNRECORDED OCCURRENCES OF *EUVANESSA ANTIOPA*.—Possibly some light is thrown upon the question of the identity of the larvæ referred to as those of the Camberwell Beauty, in the quotation under the above heading, given by Mr. Rowland-Brown (*antea*, p. 68), by the following note which occurs in Humphreys and Westwood's 'British Moths,' vol. i. p. 91, where it is stated of the larva of *Porthesia chrysorrhæa*, L.:—"It feeds on various plants, especially whitethorn, in June, and has at times become so remarkably abundant as to cause a serious panic to Londoners, especially in 1782, when prayers were offered up in the churches against the enemy; and the churchwardens and overseers of the neighbouring villages, after offering rewards for collecting these caterpillars, attended to see them burnt by bushels." It will be noted that both the date and the measure by which the quantity of the caterpillars was estimated are the same in the two accounts, and I think we should not be far wrong in assuming that Professor Hall Griffin's Camberwell Beauty caterpillars were none other than those of *Porthesia chrysorrhæa*.—ROBERT ADKIN; Lewisham, Feb. 1911.

WITH regard to Mr. Rowland-Brown's interesting reference in your last number to the abundance of larvæ in Camberwell, in 1782, I think there is little doubt but that they were *Stilpnotia salicis*, for I have met with them abroad—practically in thousands. Yet another species must be taken into consideration, viz. *Malacosoma neustria*, the larvæ of which many years ago (I am speaking of the fifties and early sixties) occurred in the greatest abundance. Trees in orchards, I can remember, were often denuded of their leaves, such were their ravages. My earliest recollections in entomology are associated with collecting the "rings" of ova of this species. With regard to *Vanessa antiopa*, in my experience the larvæ are essentially sawfly feeders. I have found them in Spain and commonly in the South of France but always on sawfly. It is true the imagines frequent willows, but is it not the *Cossus* and other exudations which attract them?—A. H. JONES; February 4th, 1911.

AUTUMNAL EMERGENCE OF *POLYGONIA C-ALBUM*, var. *HUTCHINSONI*.—During Sept. 1910, I sent the Rev. Alfred Stiff, of Leigh-on-Sea, some two dozen larvæ of *c-album* which I had bred from Wye Valley stock. During January of this year he wrote to me and said he had been most successful with them, and had bred four specimens of the var. *hutchinsoni*, which emerged mid-October. This seemed to me very strange, as none of the remainder of the brood in my hands had produced the variety, and I had never had, nor heard of the variety being bred in the autumn, it being purely a June or early July form. I had bred some of the new straw-coloured variety, unheard-of before this year, and rather expected that he had mistaken these for var. *hutchinsoni*. I therefore asked him to let me see the specimens, and

greatly to my surprise found they were very fine and large var. *hutchinsoni*.—L. W. NEWMAN; Bexley, Kent.

LATE AUTUMN AND WINTER EMERGENCE OF EMATURGA ATOMARIA.—During 1910 I reared a considerable number of *E. atomaria* from ova from Lanes. parents; the larvæ fed up rapidly and pupated in June. During July I turned out my breeding pots, collected the pupæ and stored them away in glass-top metal boxes, in as cold a place as possible for the winter. I did not again look at the pupæ till September, when I was rather surprised to find six specimens had emerged, two being dead and the other four alive. I noticed several dozens were forming up, so these were removed to a breeding cage, and the imagines duly emerged. As others continued to form up, they also were removed from their cold place and kept warm. Moths continued to emerge right up to the beginning of January, when they stopped. In all, over twenty-five per cent. of the pupæ emerged from September to January, a few almost every day.—L. W. NEWMAN; Bexley, Kent.

PHASGONURA VIRIDISSIMA (ORTHOPTERA).—Mr. B. S. Williams sends me a fine female specimen of this grasshopper, that Surrey may no longer bear the reproach of having no certain record of this fine species. It was taken by himself at Pickett's Hole, Ranmore, August 13th, 1910.—W. J. LUCAS.

HEMEROBIUS STIGMA (NEUROPTERA).—On January 29th last, a specimen of this brown lacewing was obtained by beating a young Scotch fir at the Black Pond, Esher Common, Surrey. I have found the species previously in this locality in mid-winter; but still the capture may be worth recording.—W. J. LUCAS.

TRIPHÆNA PRONUBA IN JANUARY.—This evening (Jan. 27th) I took a *T. pronuba* flying around a lamp in a room. The specimen seemed to me to be too fresh for one of the partial second brood of September, 1910. Last October I found several larvæ of this species, in the garden here, nearly full-grown and still feeding. Is this a common occurrence?—LAURENCE JONES; The Rectory, Marks Tey.

NOTES ON CHILOSIA GROSSA, CORDYCEPS, AND SMERINTHUS TILIE.—Reading the note on *Chilosia grossa* by Lt.-Col. Nurse ('Entomologist,' vol. xliii., p. 313) reminds me that, under the same circumstances, I used to come across pink larvæ about one-third of an inch long. If I remember rightly, there were several in one stem. I am afraid I did not trouble much about rearing them—probably I may be told they were some commoner well-known insect. This was when I was living near Plymouth. The illustration of *Cordyceps militaris* (*l. c.* p. 297) recalls the gruesome appearance of a large *C. ligniperda* larva I left in a cylindrical tin and neglected. As well as I can remember, the fungus was nearly an inch long and growing vertically from the whole length of the back. The damp atmosphere of the tin had evidently suited the fungus better than its host. Mr. Arkle's note (*l. c.* p. 294) that *S. tilia* is very rare in the Chester district is equally true of the Plymouth one, where I could never succeed in finding the species, though I used to dig up the pupæ fairly freely

around elms about Oxford. Around Plymouth *Sphinx ligustri* seemed to be the commonest "hawk moth." A catalogue giving the distribution of the various "hawk moths" in the several counties would be highly interesting.—(Rev.) FRED. JULIAN BRIGGS; Codrington College, Barbadoes, November 26th, 1910.

NOTES ON THE LIFE-HISTORY OF ANTITROPA ERINNYIS.—The eggs are greyish white in colour, and are laid in great numbers on both sides of the leaves of a lily (*Dracæna hookeriana*) that grows wild in the woods and elsewhere. The leaves of this plant are about two to two and a half inches in width, and very thick; consequently the young larva when it emerges must be very strong, for as soon as it is hatched it at once eats a small portion of the leaf at the edge, and then turns down the same completely over itself, joining it firmly together with white silky thread. It is then light green in colour, with a black head. It comes out of its house to eat, and after about five days it closes up each end of the same and remains therein for about two and a half to three days whilst it changes its skin; it is then green in colour, with a yellow head with six false eyes on the same, black in colour. After moulting, the larva frequently occupies the old house, if large enough; if not, it makes another, going through the same operation as before, but turning over a larger portion of the leaf. After about eight days it again changes its skin; it is then much paler green, head yellow with a brown line down the centre, which widens at the mouth; the six false eyes which are black are placed two on each side of the brown line on the front of the head and one on each side of the same. The larva now measures about three-quarters of an inch in length and eats freely, but returns very quickly to its house, always backwards, if disturbed whilst feeding. Seven days later it again changes its skin, and remains in the following state until it pupates (as the last two stages are practically identical in colour and markings): the body very nearly white and very transparent; there is a black line between the second and third segments, and between the eighth and ninth segments; on the back there is a light yellow round spot, and on the last segment above the hind claspers there is a hard yellow patch very similar to the brown one in *Pletzia fiara*. Head large and yellow in colour, with the brown marking more distinct and forming a triangle above the mouth; the six false eyes black in colour and much larger. When full grown it is a little over two inches in length. I may mention that it always comes out of its house to drop its frass. When about to pupate, which it does sometimes in its last house, it completely covers in each end of the same—the part whence the perfect insect emerges with white silk, while the old cast skin fills up the other end. Sometimes it pupates on the under side of the leaf, and then it spins a lot of white silk on that portion of the leaf and fixes itself with a band across the centre of the body. It changes in about three to four days to a very fine pupa, which is pale bluish-white in colour and has the end of the abdomen very pointed; there is a straight black line down the middle of the thorax; the six false eyes are replaced by black spots on the pupa; the case enclosing the trunk, which is only fixed to the pupa as far as the end of the wing cases,

is very long, extending about a quarter of an inch below the end of the pupa. It remains about twenty-one to twenty-eight days in this state. There is no doubt this species is very badly attacked by ichneumons, and also by dipterous flies, in all its stages, including the ovum. It is also eaten, whenever caught outside its house, by ants, mantis, cockroaches, &c., more particularly in the first two stages. The butterfly is fairly common, and has been fully described by Mr. Roland Trimen.—GEO. F. LEIGH, F.E.S.; Durban, Natal, September 27th, 1910.

ERRATA.—P. 75, line 1, for *brumata* read *boreata*; p. 75, line 8, for *back* read *bark*.

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## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 1st, 1911.*—Mr. G. T. Bethune-Baker, F.Z.S., in the chair.—It was announced that the Council had nominated the Rev. F. D. Morice, M.A., as President for the current year.—Mr. W. J. Kaye exhibited several *Heliconii* from Eastern Ecuador, including the forms *H. rubripicta*, *adonides*, and *feyeri* with streaked hind wings. He observed that it seemed now to be possible and even likely that *H. melpomene aglaope* would eventually be proved to be linked with *H. plesseni* through these newly discovered forms, and that this species would then have to be sunk as a subspecies of *H. melpomene*. Similarly, *H. notabilis* through *ilia* and *feyeri* was probably only a subspecies of *H. erato*, though the material was insufficient at present to form a conclusion.—Dr. Nicholson exhibited a new species of *Tachyporus* which he has named *fasciatus*. There were two specimens taken at Wicken Fen from under sedge refuse, the one in April, the other in August, 1910. This species is intermediate between *T. solutus*, Er., and *T. chrysomelinus*, L. It differs from the former in the shape of the antennæ, which are of the same length, but are not thickened towards the apex; by its finer puncturation throughout; by the pronounced broad black band on the elytra; and by the fact that the marginal bristles of the elytra are long and stout, as in *T. chrysomelinus*, and not short and fine, as in *T. solutus*.—Mr. H. J. Turner exhibited several very interesting forms of *Luperina guenéei*, including two new aberrations:—(i) ab. *murrayi* (n. ab.), which is quite typical *L. guenéei* in texture, shade of colour, and in markings, with this very marked difference, that the submarginal area between the dark marginal lunules and the submarginal line is much paler than any other portion of the wing, throwing out by contrast these dark lunules very conspicuously; (ii) ab. *fusca* (n. ab.), of which the three specimens exhibited are undoubted *L. guenéei* in all their characters but depth of colour. These are believed to be the first melanic specimens which have been so far obtained. All the markings are much intensified, the ground colour is much darker than in typical examples, very dark grey with, in a good light, faint flushes of a ferruginous tint. The contrast between ground colour and markings is very much stronger than in any of the other forms.—Mr. Champion exhibited on behalf of Mr. J. H. Keys the black variety of *Athous*



*hæmorrhoidalis*, F., from Dartmoor, recorded by the latter in the Ent. Mo. Mag., xlvii, p. 262; and also a red variety of the male of *Agabus bipustulatus*, L., from the same locality.—The Rev. A. T. Stiff, who was present as a visitor, exhibited some second-brood specimens of *Polygonia c-album* var. *hutchinsoni*. The vars. including three intermediates, emerged on October 16th, 19th (3), 20th, 21st (2), 22nd, 23rd and 26th, 1910. It is believed that there is no record of var. *hutchinsoni* having ever been bred in the 2nd brood of *c-album*.—Mr. Newman writes: "I have bred thousands of *c-album* of the second-brood in various years, and never one *hutchinsoni*, and I have never heard of any one else doing so."—Mr. Rowland-Brown and Mr. Bethune-Baker both observed that they had taken hibernated specimens of this form on the Continent.—Dr. O. M. Reuter communicated a paper entitled "Bryocorina nonnulla Æthiopica descripta ab O. M. Reuter et B. Poppius."—Commander Walker, one of the Secretaries, read a paper on behalf of Col. Manders, entitled "A factor in the production of mutual resemblance in allied species of butterflies." The methods adopted in his experiments, and the conclusions drawn from them by the author, were to some extent the subject of criticism both by Mr. G. A. K. Marshall and Dr. Chapman.—Mr. Merrifield added a few observations with regard to the comparative immunity of Pierine butterflies from the attacks of birds.—A vote of condolence with the family of the late Mr. J. W. Tutt was moved from the chair, all the Fellows present signifying approval by rising.—GEORGE WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 12th*, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The President referred to the great loss that the science of entomology had incurred by the death of Mr. J. W. Tutt, a past President of the Society.—Mr. Phillips, of Forest Gate, was elected a member.—Mr. Tonge exhibited photographs of the ova in situ of *Plebeius argus* (*egon*), *Euralis betula*, and *Calamia lutosa*, and also of the early stage of a wasp's nest (*Vespa sylvestris*) found in a pig-sty.—Mr. Lucas, a teratological example of *Anosia plexippus* with right fore wing shorter and narrower than normally and with concave outer margin.—Mr. Newman, (1) extremely light and very dark forms, with unusually small and very large forms, of *Malacosoma castrensis* and *M. neustria*; (2) a very red *Phlogophora meticulosa*; (3) second brood specimens of *Pericallia syringaria*, small and dark banded; (4) second brood of *Selenia lunaria*, i. e. var. *delunaria*; and (5) living imagines, pupæ and full-fed larvæ of *Aphantopus hyperanthus* reared by Mr. Oliver.—Mr. Adkin, selections of several broods reared originally from a black female ab. *nigra* of *Boarmia gemmaria*, and communicated a full note on the results.—Mrs. Hemming, bred and caught series of *Melitæa aurinia* from Wiltshire, where the species has been somewhat common.—Mr. Hemming, on behalf of Mr. P. A. Buxton, the same species with the note that all emerged in the afternoon; he also showed series of *Adopæa flava* from Sussex, showing two distinct forms.—Mr. Coote, two very dark green examples of *Panolis piniperda*.—Mr. Platt-Barrett, an example of *Saturnia pavonia-major* from Sicily.—Mr. Kaye, *Myelobius murana*, a sphingid-



like *Pyrale* from South America.—Mr. Step, specimens and a series of photographs of the growth and development of the *Myxogaster*, *Brefeldia maxima* found by him at Horsley, and a cluster of oak galls *Cynips kollari* from which birds had systematically extracted the tenant larvæ.—Dr. Hodgson, long series of varied forms of *M. aurinia* of many localities.—Mr. West called attention to the drawer of the Society's type collection which he was exhibiting, and to which, while rearranging, he had added some sixty species of Coleoptera from his own collection.—Mr. Priske showed a number of slides illustrative of the life-history of the glow-worm, which Mr. Main and he were observing, and read notes on what they had done so far.—Mr. Lucas read a paper: "Notes on the Natural Order Neuroptera," and showed a large number of lantern slides to illustrate his remarks.—HY. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Annual Meeting held at the Royal Institution, Colquhoun Street, Liverpool, December 19th, 1910, Mr. R. Newstead, M.Sc., F.E.S., Vice-President, in the chair.—The Reports of the Council and Hon. Treasurer were read and adopted, and the following members were elected as officers and Council for the ensuing year, *viz.*—President, S. J. Capper, F.E.S.; Vice-Presidents, W. J. Lucas, B.A.; C. E. Stott; Claude Morley, F.Z.S.; P. F. Tinne, M.A., M.B.; Geo. Arnold, M.Sc.; Treasurer, Dr. J. Cotton; Secretaries, H. R. Sweeting and Wm. Mansbridge; Librarian, F. N. Pierce; Council, E. J. B. Sopp, F.R.Met.S.; Wm. Webster, M.R.S.A.I.; Wm. Mallinson; W. T. Mellows; L. H. Lister; G. M. Taylor, M.A.; C. B. Williams; R. T. Cassal, M.R.C.S., L.S.A.; O. Whittaker; R. Wilding; and L. West, M.I.M.E. — Mr. Robert Newstead, the retiring Vice-President, delivered the Address, which was entitled "The Taxonomic Value of the Genital Armature in the Tsetse Flies (Genus *Glossina*)." He stated that he had made a careful examination of all the hitherto described species of the genus *Glossina*, which had not only revealed some very striking morphological characters, but had led to the discovery of three hitherto undescribed species, *Glossina submorsitans*, Newst., *G. brevipalpis*, Newst., and *G. fuscipes*, Newst., and also to the re-establishment of Bigot's *G. grossa*. The scheme of classification adopted was based entirely upon the taxonomic characters of the male armature, which are the true and almost only natural anatomic elements that can at present be found in these insects. He had found that the species fell into three very striking and distinct groups, each being separated by very trenchant characters. These are, Group I. (the *fusca* group).—This division includes the four largest species of the genus: *G. fusca*, Walker; *G. grossa*, Bigot, which have a Western distribution; *G. longipennis*, Corti; and *G. brevipalpis*, Newst., occurring chiefly on the eastern side of the continent (Africa). In all of these species the claspers are quite free, there being no membrane stretching between them; the distal extremities of these appendages have either a single large and bluntly pointed tooth-like extension, or they are bluntly bidentate; the harpes in all cases being markedly different in their morphological characters. Group II. (the *palpalis* group).—To this division

belong the following species:—*G. palpalis*, Rob. Desv.; *G. tachioides*, Westwood; *G. fuscipes*, Newst.; and *G. pallicera*, Bigot. In all of these species the claspers of the males are connected by a thin and finely spinose membrane, which is deeply divided medially, but in all cases the distal extremities of the claspers are quite free and widely separated. Group III. (the *morsitans* group).—This group comprises: *G. morsitans*, Westwood; *G. submorsitans*, Newst.; and *G. longipalpis*, Wiedemann. In these the claspers are completely united by a spinose membrane, and they are also fused medially. They are of very remarkable form, their shape somewhat resembling the scapula of a mammal in miniature, and are altogether much more highly complicated structures than those in either of the preceding groups. Thus we see in these three groups forms which are so widely different as to lead one to assume, without taking other external features into consideration, that they represent three distinct genera. Certain it is that these insects illustrate one fundamental principle of evolution, namely, that they have attained great development of one set of morphological characters and have retained others apparently of an ancestral type.

January 16th, 1911.—Mr. Geo. Arnold, M.Sc., Vice-President, in the chair.—A discussion on "*Agrotis cursoria* and its Varieties" was opened by Mr. Wm. Mansbridge, and continued by Mr. T. Baxter, of St. Anne's-on-Sea, Mr. F. N. Pierce, and other members.—Mr. Baxter brought his fine varied series of *cursoria* for exhibition, which included some very rare forms, as well as the commoner vars. *brunnea*, *ochrea*, *saggitta*, *cærulea*, *costa-cærulea*, and *obsoleta*. Mr. W. Mansbridge also brought a varied series from St. Anne's. At Wallasey and Crosby *cursoria* is of extremely rare occurrence and, though still common on the North Lancashire sandhills, it is not nearly so abundant as was the case some twenty years ago, owing to the encroachments made by builders and golfers upon its haunts. Mr. Baxter said that, having given particular attention to the matter, he had never seen the ordinary mottled form *in coitu* with the streaked form *saggitta*; he suggested that there might be two species in collections under the same name; he had seen many pairs in copulation during the last season, but they were always of similar varieties. Other exhibits were by Mr. C. B. Williams: *Hesperia lineola*, *Apamea ophiogramma*, and *Plusia moneta*, from Cambridge; a series of *Macrogaster castaneæ* and a large number of local fen species from Wicken.—Mr. Geo. Arnold brought *Pepsis formosus*, from California, locally called the "Tarantula Killer," together with our largest British Pompilid, *Salix fuscus*, for comparison; *Amonma burmeister*, male and female—the "Driver Ant"—from Central Africa.—H. R. SWEETING and WM. MANSBRIDGE, *Hon. Secs.*

#### RECENT LITERATURE.

*Catalogue of the Lepidoptera Phalaenæ in the British Museum.*  
Vol. x. By Sir GEORGE F. HAMPSON, Bart. London: Printed  
by Order of the Trustees. 1910.

In this volume of eight hundred and thirty pages the Erastrianae, a subfamily of the Noctuidæ, are catalogued and described. Of the

twelve hundred and twenty-two species comprised in the subfamily over one-fourth are novelties, whilst very nearly half of the one hundred and thirty-six genera to which the species are referred are new.

More than half of the Erastrianæ are included in the following six genera:—*Eublemma*, Hübn. (t. *suava*, Hübn.), 230 species; *Ozarba*, Walk. (t. *punctigera*, Walk.), 107 species; *Tarache*, Hübn. (t. *cafraria*, Cram.), 102 species; *Lithacodia*, Hübn. (t. *bellicula*, Hübn.), 86 species; *Eustrotia*, Hübn. (t. *uncula*, Clerck), 73 species; *Cor-gatha*, Walk. (t. *zonalis*, Walk.), 53 species.

On the other hand, upwards of sixty genera have each only one species, and seventeen other genera have but two species assigned to each of them.

The British species of Erastrianæ are:—5147. *Eublemma* (*Thalpo-chares*) *ostrina*, Hübn. 5181. *Eublemma* (*Thalpochares*) *parva*, Hübn. 5185. *Eublemma noctualis*, Hübn. (*Thalpochares*) *parva*, Hübn. 5807. *Lithacodia* (*Erastria*) *fasciana*, L. 5859. *Eustrotia* (*Hydrelia*) *uncula*, Clerck. 5862. *Eustrotia olivana*, Schiff. (*Bankia argentula*, Hübn.). 6000. *Erastria* (*Agrophila*) *trabealis*, Scop. 6185. *Tarache* (*Acontia*) *lucida*, Hüfn. (*solaris*, Schiff., *albicollis*, Fab.). Numbers show position in arrangement.

The present volume is the seventh of the series treating of the Noctuidæ. Of this extensive family of moths considerably over six thousand species have, so far, been dealt with. Not only are the species fully described, and the distribution, as indicated by specimens in the National Collection, set out, but all the new species, and also those not previously illustrated, are figured. The previous Noctuid volumes are—iv. Agrotinæ (1903); v. Hadeninæ (1905); vi. Cucullianæ (1906); vii.—ix. Acronyctinæ (1908–10).

It may be mentioned that the Atlas of Plates belonging to vol. x. will not be ready for a few months.

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*Annual Report of the New Jersey State Museum. Including a Report of the Insects of New Jersey.* Pp. 880. Trenton, N. J. MacCrellish & Quigley. 1910.

THIS is a revised and extended edition of an exceedingly useful list. It comprises references to 10,385 species, as against 8537 in the second edition (1900), known to occur in the State of New Jersey. Besides numerous illustrations in the text, there is a map, in colour, and three portraits—Head of the Biological Department, State Entomologist, and State Taxidermist.

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*A Book of Nimble Beasts.* By DOUGLAS ENGLISH. Pp. 319. London: Eveleigh Nash. 1910.

FOR boys and girls who wish to know something about the appearance and habits of some of our smaller mammals and common insects, this attractive little book should be an acceptable gift. The illustrations, over two hundred in number, are from photographs taken by the author. There are four coloured plates.

## OBITUARY.

WE regret to announce the death of GERALD GEORGE HODGSON, who was born in Brighton on October 10th, 1860, and was educated at the College there, and at King's College, London. House Physician at King's College Hospital; House Surgeon at the Brighton and Hove Dispensary; and afterwards House Physician and House Surgeon at the Sussex County Hospital. Succeeding his father, he was in private practice for eight years in Brighton, and for the last eight years had been attached to the Royal Eye Hospital, Southwark.

A very busy and strenuous life left him but few opportunities of pursuing his favourite studies of botany and entomology, the latter for many years being most intermittent, but this dearth of opportunities caused him to note more particularly the habits of the creatures he met with, and he studied closely those little things that incline to the paucity or abundance of insect life, so frequently neglected by the mere collector. In 1898 his health broke down, after a severe illness brought on by overwork and a bicycle accident, and upon his partial recovery he was peremptorily ordered to give up his profession and go for a long sea voyage. This culminated in his settling for a time in Queensland, where he took up some land and regained health in its culture. As opportunity served, he again used his net and obtained many rare and interesting butterflies whilst in the colony.

Upon his return home, he took up his last medical appointment, and in his spare time arranged his cabinet of Lycanidæ upon a plan of his own, namely, to exhibit at a glance over the drawer similar aberrations and varietal forms of each species. Thus the columns represented the species, and the cross-files the aberrations, either common to all or only to a few of the butterflies, placed together as a group.

Hodgson was a very hard worker in the field, and the toil he willingly underwent would deter many men, but with it all he was very successful, and his "luck" in obtaining varieties almost phenomenal. He was not a prolific writer, but his lectures and papers show much original work; as witness an address given to the City of London Society, 1909, opening an intended discussion upon the relative "Importance to the Rhopalocera of the upper or under sides of the wings." In this he dealt with the subject in such detail that he really covered the whole ground and left nothing debatable to be entered upon. He was also a keen botanist, and probably knew more of the life-histories of our British Orchids in the unflowering stages than any living man.

Dr. Hodgson's death was entirely unexpected. He left London, and was about to go to Devonshire for a short rest, but was found to have passed away in his sleep on Friday the 3rd ult.

In private life he was geniality personified, and much beloved by the young, entering into their sports and games with enthusiasm; whilst best of all, perhaps, was his rule of life, "If possible, let no day pass without doing some one an act of kindness." This shows what the real man was more than any adulatory epitaph.

S. W.

## EXCHANGE.

NOTICES OF EXCHANGE should be received by the 25TH OF EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each.

*Duplicates*.—Coleoptera: Chrys. Menthastri, Neb. Complanata, and Scarites Lævigatus. *Desiderata*.—Chrysm. Marginata, Callistus Lunatus, or Nebria Livida; perfect specimens only sent or wanted—*P. Lassus*; 12, Rue de l'Ouest, Colombes (France).

*Duplicates*.—Z. Trifolii, Complanula, Baja, Lubricipeda, Auriflua, Dispar, Tridens, Pallens, Micacea, Lithoxylea, Testacea, Strigilis, Tritici, Segetum, Typica, Augur, C-Nigrum, Rubi, Stabilis, Litura, Gemina, Spadicea, Flavocincta, Meticulo-losa, Chi, Mi, Glyphica, Illunaria, Alniaria, Hirtaria, Betularia, Rhomboidaria, Dilutata, Cervinaria, Mensuraria. *Desiderata*.—Many common Geometers to renew; black pins.—*F. J. Rasell*; Weedon Road, Northampton.

*Duplicates*.—Semele, Blandina, Salicis,\* Mundana, Rurea\* (dark), Graminis, Nictitans, Persicaria,\* Haworthii, Fulva, Chi, Baia,\* Augur,\* Nigra, Impluviata, Cambrica, Filigrammaria, Lunaria, Absinthiata,\* and Bidentata.\* *Desiderata*.—Euphrosyne, Malva, and many to renew.—*W. G. Clutten*; 132, Cole Clough Lane, Burnley, Lancs.

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