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EDITORIAL.

WE have very great pleasure in adding the name of Mr. CLAUDE MORLEY to the list of specialists who are good enough to advise and assist us in their particular departments of Entomology. Mr. Morley, who is the author of 'The Ichneumons of Great Britain,' and of other works on Hymenoptera, has already contributed various instructive and helpful papers to our pages, and it is hoped that his closer connection with the magazine may be followed by the appearance of many other articles from his pen.

ZENILLIA (*MYXEXORISTA*) *ROSEANÆ*, B. & B., A NEW BRITISH DIPTERON.

BY JAMES E. COLLIN, F.E.S.

IN November last I received from Mr. R. Adkin several specimens of the dipteron to which he refers in the subjoined note as having been reared from pupæ of *Tortrix pronubana*, Hb. They were submitted to Mr. C. J. Wainwright, who has made a special study of the Tachinid group to which they clearly belonged, and he is of opinion that they are undoubtedly referable to *Zenillia roseanæ*, B. & B., a species not hitherto recognised as British and which may be known by the following characters:—

A small to moderate sized species of the usual Tachinid appearance, black with greyish reflections. Face and orbits whitish. Eyes sparsely hairy. Frons only slightly produced, at the vertex about one quarter the width of the head (female), slightly less in the male; two pairs of orbital bristles in the female, none in the male; frontal bristles in a single row extending scarcely beyond the level of the insertion of the arista, outside this row for its entire length there are a number of fine hairs, scattered in the male, but less numerous and almost in a single row in the female. Ocellar bristles developed, pointing forwards. Mouth margin not produced, one strong pair of vibrissæ placed just above the mouth opening, the smaller oral bristles continued in a row

quite halfway up the face. Cheeks bare, jowls narrow, about one sixth the height of eye. Palpi stout and black. Antennæ very long, third joint quite four times the length of second, arista bare, distinctly thickened to about the middle, second joint not much lengthened. Scutellum blackish grey, terminal bristles crossed and not erect, though slightly upturned. Abdomen ovate, with discal and marginal macrochetæ. Hind tibiæ with unequal bristles, ungues microscopically pubescent, nearly as long as last tarsal joint (male), much shorter (female). Wings with first posterior cell open, ending just before wing tip, angle of cubital vein slightly rounded and without an appendix, radial vein bristly at base only. Length 4–6 mm.

Zenillia (*Myxexorista*) *roseanæ* was described by Brauer & Bergenstamm in Denkschr. Akad. Wien lviii. (1891) p. 332. It was known to them in the female sex only, the specimens having been bred from *Tortrix roseana*, Hw., and no one appears to have recognised the species since.

Mr. Adkin has also reared another parasitic dipteron from *Tortrix pronubana* which appeared with the above; this second species is *Nemorilla maculosa*, Mg., which is reported as having been bred on the Continent from *Acrobasis consociella*, Hb., *Cacœcia murinana*, Hb., *Psecadia bipunctella*, F., *Rhodophœa suavella*, Zk., *Sylepta ruralis*, Scop., and *Pyralis* sp.

Newmarket: December, 1908.

The first traces of the parasite referred to above were seen in June last, when, in the cage in which I was keeping the pupæ of *Tortrix pronubana*, I found several dipterons not unlike small houseflies in general appearance. Upon closer investigation I found among the leaves in which the *Tortrix* had pupated the puparia from which the dipterons had emerged. In the autumn I again collected wild larvæ of *T. pronubana*, which in due course pupated, and the dipterons again began to appear. I therefore made a careful examination of the pupal webs, and in many cases found a dipterous puparium in the web alongside the lepidopterous pupa; in every case the pupa had been fully formed before the parasitic larva emerged from it. The number of pupæ infested I should estimate at fully twenty per cent. *Tortrix roseana*, the species from which Bergenstamm reared the original specimens of *Zenillia roseanæ*, occurs in the same gardens where *T. pronubana* is found, and is also pretty generally distributed throughout the surrounding country; it is therefore quite likely that the dipteron may all along have infested that species, but been overlooked, and that having found a more suitable host in the double-brooded *T. pronubana*, has been able to multiply more rapidly, and even become a serious menace to its existence; yet it should be noted that larvæ of *Tortrix podana* and *Batodes angustiorana*, taken in some numbers at the same time and place as the spring larvæ of *T. pronubana*, showed no signs of the parasite.—Robert Adkin.

THE GENERIC NAME *ACIDALIA*.

By Louis B. Prout, F.E.S.

Now that we have the excellent "International Code" of nomenclature to guide us, together with the supplementary report which appeared in the American 'Science' for Oct. 15th, 1907 (pp. 520-523), there is some hope of definite progress towards a correct application of generic names, and I trust we can give a decent burial alike to the Scudderian phantom of "restriction" of one name *by another*, and the fetich of "page-priority." In my own work under this code I have found exceedingly few cases of perplexity, and most of those long academic discussions which have delighted some of us will no more be necessary. Of Treitschke's genera, mostly founded in 1825 on "bibliographic references" to Schiffermüller, and therefore prior to those of Hübner's 'Verzeichniss' (apparently not published till 1826), nearly all had types selected for them by Duponchel in 1829, and only three or four of his selections were really unhappy on diagnostic grounds. At the moment I am only concerned with *Acidalia*.

Assuming that the date 1826 will be definitely accepted for Hübner's 'Verzeichniss,' the name *Acidalia* really belongs to the Geometridæ. In my "Notes on the Wave Moths" (Entom. xxxviii. 6) I pointed out that the only logical type for *Acidalia* according to the diagnosis was *brumata*, Linn., and I strongly adhere to that as my own personal opinion. But Duponchel in 1829 selected *strigaria*, Hb.; Curtis in 1831 *aversata*; and Stephens in 1835 (Ill. Haust. iv. 393) *ochrata*. By the strict rule Duponchel's selection must stand unless (1) the genus already possessed a type "on the basis of the original publication"; or (2) *strigaria* was "not included under the generic name at the time of its original publication," or was a *species inquirenda* from Treitschke's standpoint, or was doubtfully referred by him to *Acidalia* (vide 'Science,' 1907, p. 521). The first was certainly not the case; of the contingencies under (2), only the question of the *species inquirenda* could apply, for Treitschke did include *strigaria* in 1825, and not with a query. I believe, however, that he was fairly well acquainted with the species.

If, then, Duponchel's action can be set aside, it can only be on the ground of the nature of the "indication" of the genus. *Acidalia*, Tr., was, at its original publication in 1825, mainly a *name* for an unnamed genus of Schiffermüller's (1775), and Schiffermüller did *not* include *strigaria* therein (if, as I believe, *strigaria*, Hb., Tr. = *virgulata*, Schiff., the last-named placed it in a *different* genus).

But it is, I suppose, better that a few generic names should

be illogically applied than that complicating exceptions should be allowed into a simple system; and in any case *ochrata*, Scop. (Stephens' choice—Curtis' is *ultra vires*, for *aversata* was placed in *Idæa*, Tr.), which would *have* to be accepted under the Code, would no better fulfil the evident original intention of Schiffermüller and Treitschke than does *strigaria*. Therefore, I accept *strigaria*, Hüb., as the type of *Acidalia*, Tr., Dup. restr. Perhaps it is a just retribution on Treitschke for creating such a "mixed genus," and it saves the name of *Operophtera*, Hüb., for *brumata*.

I showed in 'The Entomologist' for 1906 (xxxix. 266) that on every conceivable ground then known to me *ornata*, Scop., was the type of Schrank's genus *Scopula*; and as I believe no one had ever previously "selected a type" from Schrank's two species, I claim that this action can stand, in spite of the indifference of the Code to generic diagnosis. The genus, if we give it Hampson's scope, will be *Scopula* = *Acidalia* = *Arrhostia* = *Leptomeris* = *Craspedia* = *Emmiltis* = *Dosithea*; but as it is possible to make a separate genus, on wing form, for the *ornata* group, I would suggest that believers in small genera subdivide thus:—

A. *Scopula*, Schrank = *Craspedia*, Hb. = *Dosithea*, Dup. (type, *ornata*, Scop.). Hind wing with margin more or less scolloped, especially between vein 4 and 6.

B. *Acidalia*, Tr. = *Arrhostia* (Hb.), H.-S. = *Leptomeris* (Hb.), Meyr. = *Emmiltis* (Hb.)Warr., (type, *virgulata*, Schiff. = *strigaria*, Hb.). Hind wing with margin not scolloped.

Sterrha, Hb., and *Ptychopoda*, Stph., abide unmoved amidst all these changes.

December 9th, 1908.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By George Wheeler, M.A., F.E.S.

(Continued from vol. xli. p. 307.)

Before entering upon the general question of variation, and especially upon the original descriptions of the named varieties, there is one of the latter which seems to me to merit special attention on the ground that it is almost certainly a distinct species, *viz.* the Bukowina form generally known as *aurelia* var. *dictynnoïdes*, Horm. This form is described very completely and at great length in 'Iris,' x., pp. 2 *et seq.* (1898). Finding that no specimen at my disposal really corresponded with this description, particularly in the matter of the remarkably elongated wings, on which great stress is laid in the description, I wrote to Herr von Hormuzaki, who courteously replied, sending me a pair taken on Mt. Cecina, near Czernowitz, the same locality from which the

originally described specimens came. These are of course absolutely authentic, and I exhibited them the day after their arrival (*i.e.* Nov. 18th) at the meeting of the Ent. Soc. of London, and also on the 26th at the South London Meeting. They may be most readily described as the converse of *britomartis*, having the *upper side* of *dictynna*, but the *under side*, as Hormuzaki says, generally nearest to *parthenie*, but often to *athalia* and sometimes even to *deione*, "but never," as he remarks, "like *aurelia*," and, one may add, still less like *dictynna*. Hormuzaki's account is too long for transcription, and also unfortunately treats the dark part as the ground-colour (excusably enough in the Bukowina *Melitæas* of this group), so that the simplest plan would seem to be to describe it from his specimens in terms of the general description of the group (vol. xli., pp. 200, 201, 221), noting those respects in which he mentions this form as being variable.

Up. s. f. w.: Lunules replaced by small quadrangular or irregularly triangular spots in the male, occasionally regularly triangular in the female, the lowest always absent and the third always somewhat the largest. Subterminal and elbowed lines thick, leaving small, more or less quadrangular spots of the ground colour; inner subterminal almost as much bent as in *athalia*; marginal blotch very large but sometimes containing a patch of the ground colour, especially in the female. Stigma oval, containing traces of the ground colour, or only thickly outlined; basal lines thick, or, in the male, included in the basal suffusion which almost reaches the marginal blotch.

Up. s. h. w.: Outer line coalescing with border, so as to form a broad marginal band, rarely showing traces of a row of spots of the ground colour in the male, oftener in the female, where they are sometimes fairly distinct, round, triangular, or even lunular, whitish in some females and in one male, especially near the costa; inner line included in the large basal suffusion, which in some males extends over the whole wing, as in *dictynna* ab. *seminigra* (Musch.), though occasionally it only reaches to the extra line, giving another line of spots of the ground colour, or sometimes of a lighter shade, some of which are in rare cases lengthened out towards the base.

Un. s. f. w.: Inner line of border bearing (in both my specimens) small dark triangles as in *deione*; lunules light, especially towards the costa, and two or three light spots between the subterminal lines, the outer of which is distinct, the inner traceable, throughout; elbowed line represented by a row of spots, most conspicuous, as is the inner subterminal, near the costa; marginal blotch very small, the other dark markings clear but fine.

Un. s. h. w.: Inner edge of border slightly angulated, both parts of terminal band nearly (or quite) unicolorous, which is also the case in my specimens with the central band; outer band interrupted near costa, the lunules almost reaching the central band, and being utterly destitute of the black points of *dictynna* and *britomartis*; central band very broad, the third and fourth spots not projecting far beyond the others; inner band rather narrow, with small light spot, basal band also narrow, with very small central spot and the fifth spot absent.

Antennæ as in *athalia*, but with even less white edging at the joints above; beneath, the white sometimes runs into the side of the tip.

As the palpi appear to vary it will be best to give Hormuzaki's own description. He says that they are black from above, with occasionally a few red-brown hairs, never with whitish or greyish-yellow hairs, though he has two specimens whose palpi, seen from above, are reddish. The outer side is occasionally red-brown throughout, the terminal joint being generally of this colour, or reddish-yellow, but occasionally black, the middle and lower joints are, however, generally black towards the base, rarely sprinkled with yellow, but the yellow becomes much more noticeable on the middle joint, and towards the terminal joint merges into red-brown. The hair forms a reddish-yellow or black brush towards the end of the middle joint. The inner side of the lower and middle joints is bright yellow but towards the terminal joint generally reddish, though sometimes blackish or red-brown.

Much stress is laid by Hormuzaki on the elongated shape of the wings and a number of measurements given to show how constant is this peculiarity in comparison with *athalia*; this is certainly very noticeable in the case of a pair of Bukowina *athalia* kindly sent to me by him with the *dictynnoïdes*, but I possess *athalia* from the Rhone Valley and the lower Vaudois Alps with wings quite as elongated, especially in the female. The Bukowina examples have a remarkably square and "cobby" appearance, even more so than the mountain specimens from Switzerland. I think that if I were exclusively a "study-lepidopterist" without any "field" experience (such people really do still exist, and even propound theories in more than one European language), I should be inclined on the mere face of things to regard *dictynnoïdes* as a very dark form of *athalia*, but the field knowledge which Hormuzaki brings to bear on the subject puts this theory out of the question; for he tells us that these are the only two *Melitæas* of this group that are common in Bukowina and the neighbouring districts; that *dictynnoides*, the commoner of the two, is found in some places where *athalia* is not; that in others *athalia* only is found; but that in many places both occur together. Moreover, *dictynnoïdes* flies from the beginning of June, or sometimes the end of May, and never later than mid-July, whereas *athalia* appears about June 30th and continues till near the end of July. With *aurelia*, with which it is generally placed, it has nothing whatever in common, and even if it had, the case of those who hold this theory would be put out of court by the fact that typical *aurelia*, differing very little from the Valais form, is also taken at Czernowitz, where it comes out from three weeks to a month later than *dictynnoïdes*; it is, however, scarce, and this is its only known locality in Bukowina. The upper side is certainly near *dictynna*, but the under side separates it entirely from that species;

it is still further from *varia*, further still (in spite of some resemblance on the under side) from *deione* and *parthenie*, is the very converse of *britomartis*, and has not even a superficial resemblance to any form of *asteria*. The earlier stages, when they become known—which there is reason to hope may be during next season—may give cause for the reconsideration of any opinion now expressed, but so far as our present knowledge extends, I feel no doubt that we should regard it as a distinct species. The question of its phylogeny is most interestingly discussed in the same paper, and to this reference will have to be made again.

THE DRAGONFLIES OF EPPING FOREST IN 1908.

By F. W. & H. Campion.

The season began with a backward spring, but at least the usual number of dragonflies appeared with the beautiful weather which came in June. By the end of August dragonflies had become decidedly scarce, although a few of the common kinds survived to enjoy the warm summer-like days of early October.

Unusually late dates were recorded for *Libellula depressa* and *Æschna grandis*.

Erythromma naias was added to the list of Odonata collected by ourselves in Epping Forest. That list now consists of twenty-one species, or exactly one half the total for the British Islands.

An account of the captures made during the year is given below, the species being named in the order in which they came under our observation.

(1) *Pyrrhosoma nymphula* was, as is usual in our district, the dragonfly earliest on the wing, and a single immature female was obtained on May 10th. On May 31st a male was discovered to have the right hind wing in a very rudimentary state. It is a remarkable fact that we have in our collection quite a number of dragonflies, belonging to various species, having the same wing in a more or less undeveloped condition. *P. nymphula* was not noticed after July 12th

(2) *Cordulia ænea* occurred very early in the season, a somewhat immature male being taken on May 17th. A week later (May 24th) we obtained two newly-emerged females, from which we learned that at that stage of development the abdomen is emphatically purple, although the front of the thorax is already green. The eyes were opaque brown, and the band between segments two and three, instead of being yellow, was dirty white. The wings were brownish, and the basal saffron was pale and indistinct. The accessory membranes were satin-white, and the pterostigmata grey. On June 7th two more females were taken, both fine adult specimens. One of them had the wings very

dark and the saffron strongly marked. On this occasion we were able to confirm what we had observed in a previous year, that the eyes of the female are wholly green, little if at all inferior, in richness of colour, to the splendid eyes of the male. De Selys is quoted in Mr. Lucas's book as stating that in the female there is a "chestnut tint to upper surface of eyes," but, so far as the adult insect is concerned, this statement is not in accord with the observations here recorded. A female was observed to be ovipositing on June 21st. By July 12th, when the last specimen was obtained, the species had become very scarce, and it was noticed that the eyes of the male then taken were losing the translucent green observed so recently as a week before, and were acquiring a tinge of chestnut.

(3) *Agrion puella*.—The first specimens were taken on May 31st and the last on August 16th. On June 28th a male was obtained while feeding upon a small moth, which had already lost its head and its left hind wing. The prey was identified as *Tortrix viridana*, and the identification was kindly confirmed by Mr. R. South. The form of the female having cuneiform blue spots on segments three to six occurred on June 21st and July 5th and 12th.

(4) *Ischnura elegans*, first taken on May 31st, continued to be met with until August 30th. The form of the female known as *rufescens* was taken on July 12th and 26th, and the form named *infuscans* on June 14th and 21st, July 5th and 25th, and August 30th.

(5) *Enallagma cyathigerum* was found in flight from May 31st to Sept. 12th. On June 8th a male was taken with the anterior portion of the spot on segment two entirely disconnected from the circlet behind; the spot closely resembled the exceptional marking numbered 1 on plate xxvii. of 'British Dragonflies.' A female of the type (blue) form was collected on July 12th.

(6) *Libellula depressa* was first seen on the wing on May 31st, but no specimens were taken before June 28th. The latest capture was that of a single male on September 7th, an extremely late date for the species. Notwithstanding the fact that this year's specimens (four males) were obtained from widely separated parts of the Forest, they all differ in a marked degree from those taken in other seasons in having the abdomen narrow and strongly triquetrous, instead of broad and flattened.

(7) *Erythromma naias* was met with by us for the first time in Epping Forest on June 14th, when it was in fine condition and fairly well distributed along the margins of one of the Forest ponds. It was seen again on several occasions, at that and other ponds, but specimens were then difficult to get, owing to their usually flying well away from the banks, and resting upon the floating leaves of *Potamogeton*. In such circumstances they were very liable to be mistaken for *I. elegans* or overlooked

altogether, and herein may lie the explanation of their having escaped our notice in previous years, although in 1900 Mr. F. Enock bred the species from nymphs taken at Loughton (Entom. 1901, p. 68). No captures were made after June 28th, but the species probably lasted for some time longer.

(8) *L. quadrimaculata* was not uncommon in the central parts of the Forest, where captures were made on June 28th.

(9) *Anax imperator* was first met with on June 28th, when two males were taken, one of them with wings in poor condition. We think it incorrect to describe the eyes of this species as blue, and that a truer description would be:—Eyes opaque green, lightly shot with translucent blue on their upper surface. On the same occasion a male, not taken, was observed to dash through a swarm of *Tortrix viridana*, which were flying about an oak-tree, and was seen to seize and fly off with one of the moths. A specimen was noticed as late as August 2nd.

(10) *Æschna cyanea*, usually such a common insect, was decidedly scarce. A newly-emerged male was taken, with its discarded nymph-skin, on July 5th, and provided us with a date for the species earlier by sixteen days than our previous earliest date. No specimen with the mature coloration was obtained before August 16th (a male), but we continued to meet with the insect until October 18th, when another male was taken.

(11) *Æ. grandis* was first seen in flight on July 25th, and a very immature female was taken on August 2nd, although the species, in fully adult condition, was already common. On Aug. 9th, by which time this insect had become extraordinarily abundant everywhere in the Forest, a female taken while ovipositing had segment six and the following segments of the abdomen wet from immersion in the water. Another female, similarly engaged, was netted on September 6th, and had more than half the segments (Nos. 5–10) in a wet state. On September 27th we watched for a considerable time a specimen of *Æ. grandis* hawking over a pond, and saw it take several insects in succession, some of which it deliberately discarded after examination: this observation was interesting as showing that all is not prey that comes to a dragonfly's jaws. A female was obtained as late as October 11th, and the species was again seen even a week after that.

(12) *Sympetrum striolatum*.—Immature females made their appearance on July 25th, but no males could be found before August 9th. The species was never really common, and the last capture was effected on October 18th.

(13) *S. sanguineum*. — The only examples secured were a freshly-emerged female (July 26th) and an adult male (Sept. 12th). The first was obviously a native of the pond at which it occurred. In the matter of coloration, the chief points which distinguished this specimen from adult females appeared to be these:—Saffron at base of wings inconspicuous; pterostigmata greenish grey;

dorsal aspect of thorax and abdomen brownish yellow; abdomen without white powder on ventral surface.

(14) *Lestes sponsa* was plentiful in one locality on August 10th; a few of the males were immature, and deficient in blue powder on those parts which take on a pruinose condition in later life. The species was again met with, at another locality, on August 16th.

Among dragonflies seen but not taken may be mentioned a single *Calopteryx* (June 14th), and an Æschnid with which we got to very close quarters on September 10th; judged by its size and manner of flight, it must have been *Æ. mixta*.

33, Maude Terrace, Walthamstow:
Dec. 1st, 1908.

LIST OF PAPERS OF THE LATE MARTIN JACOBY.

By George Jacobson.

All the numerous entomological publications (one hundred and forty-one in number) of the late Martin Jacoby (who died Dec. 24th, 1907) are devoted to one family of beetles only, to the Chrysomelidæ or Phytophagous beetles. The author has described 238 genera, 5094 species, and 7 varieties in this family. According to this enormous number of described species, which embraces one-fourth of all the known species of the family, we must range M. Jacoby in the first place among workers in the field of descriptive morphology of Chrysomelidæ.*

Jacoby's influence as authority within the narrow limits of this family is particularly great, because he concentrated his attention on the study of the Chrysomelidæ exclusively, and never went beyond it. Even in the family he seems to have ignored two large subfamilies: Cassidini and Hispini. Moreover, of Palæarctic forms he described only one species from the Island of Crete, and a few species from Japan and North China. The great majority of his papers are purely descriptive, except Nos. 68, 88, 90, 123, 124, and 127 (concerning external morphology of separate groups and genera), Nos. 11 and 140 (representing two faunistic revisions with some descriptive material), and Nos. 106, 116, 117, 130, 131, and 136 (of general systematic interest).

1. Description of New Genera and Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1876, pp. 807–817. [1 new genus, 21 new species, 1 new variety.]

* We possess no data concerning the numbers of species described within limits of this family by other specialists, but there is no doubt that no other coleopterist (even Baly in England) has described so many forms as the late Martin Jacoby.

2. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1877, pp. 510–520. [18 new species.]

3. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1878, pp. 144–153. [21 new species.]

4. Description of New Species of Phytophagous Coleoptera from Central and South America. Proc. Zool. Soc. London, 1878, pp. 982–996. [29 new species.]

5. Verzeichniss der von Herrn Ed. Steinheil in Neu-Granada gesammelten Cryptocephalini und Criocerini. Mitth. München. Ent. Ver. ii. 1878, pp. 134–162. [25 new species.]

6. Descriptions of New Species of Coleoptera of the Family Halticidæ. Proc. Zool. Soc. London, 1879, pp. 439-446. [16 new species.]

7. On Phytophagous Coleoptera collected by Mr. Thamm at Chanchamayo, Peru. Cist. Ent. ii. 1879, pp. 513–527. [26 new species.]

8. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1879, pp. 773–793. [38 new species.]

9. Descriptions of New Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1880, pp. 166–182, pl. xviii. [32 new species.]

10. On a Collection of Phytophagous Coleoptera made by Mr. Buckley at Eastern Ecuador. Proc. Zool. Soc. London, 1880, pp. 588–609, pls. liv.–lv. [36 new species.]

11. Biologia Centrali-Americana, edited by D. Godman and O. Salvin. Insecta ; Coleoptera. Vol. vi. Part 1. Phytophaga (part). London, 1880–92. 4to, xx.–625 pp. 43 pls. [26 new genera, 826 new species, 2 new varieties.]

— Supplement . . . . 1888–92, 374 pp. [16 new genera, 350 new species.]

12. Descriptions of New Genera and Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1881, pp. 439–450. [2 new genera, 20 new species.]

13. Decriptions of New Genera and Species of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1882, pp. 50–58. [3 new genera, 15 new species.]

14. Descriptions of some New Species of Beetles of the Family Galerucidæ. Proc. Zool. Soc. London, 1883, pp. 399–406, pl. xlv. [12 new species.]

15. Zur Kenntniss der Gattung Microlema, Baly. Stettin. Ent. Zeitg. xliv. 1883, pp. 125–127.

16. Beschreibungen neuer Phytophagen. Stettin. Ent. Zeit. xlv. 1884, pp. 126–128. [3 new species.]

17. Two New Species of Malayan Phytophagous Coleoptera. Notes Leyden Mus. vi. 1884, pp. 7–8. [2 new species.]

18. Descriptions of New Genera and Species of Phytophagous Coleoptera from Sumatra. Notes Leyden Mus. vi. 1884, pp. 9–70. [8 new genera, 55 new species.]

19. A New Species of the Phytophagous Genus *Haplosonyx*. Notes Leyden Mus. vi. 1884, p. 71. [1 new species.]

20. On *Haplosonyx sexplagiatus*, Baly. Notes Leyden Mus. vi. 1884, p. 72.

21. Descriptions of New Genera and Species of Phytophagous Coleoptera Collected by Dr. B. Hagen at Serdang (East Sumatra). Notes Leyden Mus. vi. 1884, pp. 201–230. [5 new genera, 26 new species.]

22. Description of two New Species of the Phytophagous Genus *Pachytoma*. Notes Leyden Mus. vi. 1884, pp. 231–232. [2 new species.]

23. Description of a New Genus and three New Species of Malayan Galerucinæ. Notes Leyden Mus. vi. 1884, pp. 234–235. [1 new genus, 3 new species.]

24. Descriptions of New Genera and Species of Phytophagous Coleoptera from the Indo-Malayan and Austro-Malayan subregions, contained in the Genoa Civic Museum, I.–III. Ann. Mus. Civ. Genova, xx. 1884, pp. 183–233; (2) ii. 1885, pp. 20–57, (2) iv. 1886, pp. 41–121. [16 new genera, 212 new species, 1 new variety.]

25. Descriptions of the Phytophagous Coleoptera of Japan, obtained by Mr. George Lewis during his Second Journey, from February, 1880 to September, 1881, I.–II. Proc. Zool. Soc. London, 1885, pp. 190–211, 719–755, pl. xi. xlvi. [1 new genus, 82 new species, 1 new variety.]

26. Beschreibung einer neuer Œdionychis-Art von der Insel Creta. Stettin. Ent. Zeitg. xlvii. 1885, pp. 215–216. [1 new species.]

27. Descriptions of some New Species and a New Genus of Phytophagous Coleoptera. Proc. Zool. Soc. London, 1885 (1886), pp. 925–929. [1 new genus, 8 new species.]

28. Descriptions of some Undescribed Species of Phytophagous Coleoptera from Abyssinia contained in the Genoa Civic Museum. Ann. Museo Civ. Genova (2) iv. 1886, pp. 129–128. [8 new species.]

29. [and *Bates, H. W.*] List of a small Collection of Coleoptera obtained by Mr. W. L. Sclater in British Guiana. Proc. Zool. Soc. London, 1887, p. 490, fig.

30. Description of two New Species of *Æsernia*. Notes Leyden Mus. ix. 1887, pp. 300–302. [2 new species.]

31. Descriptions of some New Genera and Species of Phytophagous Coleoptera contained in the Leyden Museum. Notes, Leyden Mus. ix. 1887, pp. 229–243. [2 new genera, 14 new species.]

32. Descriptions of the Phytophagous Coleoptera of Ceylon, obtained by Mr. George Lewis during the years 1881–82. Proc. Zool. Soc. London, 1887, pp. 65–119, pls. x.–xi. [16 new genera, 90 new species.]

33. Notes on Some North American Species of Halticinæ (Group Monoplati). Trans. Amer. Ent. Soc. xv. 1888, pp. 302–303.

34. Some New Species of Phytophagous Coleoptera from Brazil (Colony Blumenau). Notes, Leyden Mus. x. 1888, pp. 153–160. [6 new species.]

35. Descriptions of New Species of Phytophagous Coleoptera from Kiukiang (China). Proc. Zool. Soc. London, 1888, pp. 339–351. [18 new species.]

36. Descriptions of New or Little-known Species of Phytophagous Coleoptera from Africa and Madagascar. Trans. Ent. Soc. London, 1888, pp. 189–206, pl. vii. [4 new genera, 21 new species.]

37. Descriptions of some New Species of Phytophagous Coleo-

ptera. Entom. Monthly Mag. xxv. 1889, pp. 203–206. [6 new species.]

38. List of the Phytophagous Coleoptera obtained by Signor Modigliani at Nias and Sumatra, with Descriptions of the New Species. Ann. Mus. Civ. Genova (2) vii. 1889 (1890), pp. 278–287 pl. iv. [1 genus, 6 species.]

39. List of Crioceridæ, Cryptocephalidæ, Chrysomelidæ, and Galerucidæ collected in Venezuela by M. Simon, with Descriptions of the New Species. Proc. Zool. Soc. London, 1889, pp. 263–292 [43 new species.]

40. List of the Phytophagous Coleoptera obtained by Signor L. Fea at Burmah and Tenasserim, with Descriptions of the New Species. Ann. Mus. Civ. Genova (2) vii. 1889 (1890), pp. 147–237. [5 new genera, 81 new species.]

41. Descriptions of some New Species of South American Halticidæ of the group Œdipodes. Ent. Monthly Mag. (2) i.–xxvii. 1890, pp. 45–47, 67–69. [9 new species.]

42. Descriptions of New Species of Phytophagous Coleoptera received by Mr. J. H. Leech from Chang Yang, China. Entom. xxiii. 1890, pp. 84–89, 114–118, 161–167, 193–197, 214–217, pls. i.–ii. [2 new genera, 39 new species.]

43. Descriptions of Two New Species of Phytophagous Coleoptera from the East. Entom. xxiii. 1890, pp. 253–254. [2 new species.]

44. Descriptions of some New Species of Phytophagous Coleoptera from India. Entom. xxiv. 1891, Suppl. pp. 31–34. [10 new species.]

45. On some New Species of Phytophagous Coleoptera from Various Regions. Entom. xxiv. 1891, Suppl. pp. 35–41. [14 new species.]

46. Descriptions of some New Species of Phytophagous Coleoptera. Entom. xxiv. 1891, Suppl. pp. 62–65. [7 new species.]

47. Descriptions of some New Species of Phytophagous Coleoptera, and Synonymic Notes. Entom. xxv. 1892, Suppl. pp. 86–88. [7 new species.]

48. Descriptions of some New Genera and Species of Phytophagous Coleoptera from Madagascar. Proc. Zool. Soc. London, 1892, pp. 564–579, pl. xxxix. [5 new genera, 28 new species.]

49. Viaggio di Leonardo Fea in Birmania e regioni vicine. LI. Description of the New Genera and Species of the Phytophagous Coleoptera. Ann. Mus. Civ. Genova (2) xii. 1892, pp. 869–999. [6 new genera, 155 new species.]

50. Description of a New Genus of Phytophagous Coleoptera from Africa. Ent. Monthly Mag. xxix. 1893, pp. 275–276. [1 new genus, 1 new species.]

51. Descriptions of some New Species of Donaciinæ and Criocerinæ contained in the Brussels Museum and that of my own. Ann. Soc. Ent. Belg. xxxvii. 1893, pp. 261–271. [16 new species.]

52. Descriptions of some New Genera and New Species of Halticidæ. Trans. Ent. Soc. London, 1893, pp. 145–158. [2 new genera, 22 new species.]

53. Descriptions of some New Species of Eumolpidæ and Halticidæ from Africa (Gaboon). Entom. xxvi. 1893, Suppl. pp. 97–101. [1 new genera, 10 new species.]

54. Notes on some Species of Galerucidæ. Entom. xxvi. 1893, Suppl. 102–103. [1 new genus.]

55. Descriptions of some New Species of Phytophagous Coleoptera from the East. Entom. xxvi.–xxviii. 1893–95, Suppl. pp. 105–111. [13 new species.]

56. Descriptions of some New Species of Phytophagous Coleoptera from Bolivia. Ann. Soc. Ent. Belg. xxxvii. 1893, pp. 272–281 [18 new species.]

57. Descriptions of New Genera and Species of Phytophagous Coleoptera obtained by W. Doherty in the Malayan Archipelago. Novit. Zool. i. 1894, pp. 267–330. [4 new genera, 140 new species.]

58. Descriptions of New Genera and Species of Phytophagous Coleoptera from Africa and Madagascar. Novit. Zool. i. 1894, pp. 508–554. [2 new genera, 45 new species.]

59. Descriptions of some New Genera and Species of Phytophagous Coleoptera contained in the Collection of the Brussels Museum and my own. Ann. Soc. Ent. Belg. xxxviii. 1894, pp. 184–197. [2 new genera, 18 new species.]

60. Descriptions of New Species of Coleoptera of the Genera Œdionychis and Asphæra. Proc. Zool. Soc. London, 1894, pp. 609–631, pl. xxxviii. [43 new species.]

61. Contributions to the Knowledge of African Phytophagous Coleoptera, I.–II. Trans. Ent. Soc. London, 1895, pp. 159–179, 317–341. [1 new genus, 65 new species.]

62. Chrysomeliden von Togo (Bismarckburg). Deutsche Ent. Zeitschr. 1895, pp. 165–188. [29 new species.]

63. Descriptions of New Species of Phytophagous Coleoptera from the Indo- and Austro-Malayan Regions. Stettin. Ent. Zeitg. lvi. 1895, pp. 52–80. [41 new species.]

64. [=129]. New Species of Phytophagous Coleoptera from Madagascar, collected by E. and B. Perrot, in the Collection of R. Oberthur. Novit. Coleopt. i. 1895, pp. 1–6.* [1 new genus, 5 new species.]

65. Descriptions of the New Genera and Species of Phytophagous Coleoptera obtained by Mr. Andrewes in India, I.–II. Ann. Soc. Ent. Belg. xxxix. 1895, pp. 252–288; xl. 1896, pp. 250–304. [8 new genera, 115 new species.]

66. Description of the New Genera and Species of Phytophagous Coleoptera obtained by Dr. Modigliani in Sumatra. Ann. Mus. Civ. Genova (2) xvi.–xxxvi. 1896, pp. 377–501. [3 new genera, 145 new species.]

67. List and Descriptions of the Phytophagous Coleoptera by Dr. Modigliani from Mentawei Islands. Ann. Mus. Civ. Genova (2) xvii.–xxxvii. 1896, pp. 126–148. [28 new species.]

68. Remarks on the System of Coloration and Punctuation in the Beetles of the Genus *Calligrapha*. Proc. Zool. Soc. London, 1896, pp. 224–225.

* *Non vidi.*

69. Descriptions of some New Species of Phytophagous Coleoptera from the Loo-choo Islands. Entom. xxix. 1896, pp. 5–8. [7 new species.]

70. On some Species of Phytophagous Coleoptera collected by Captain V. Bottego in Central and Southern Somaliland. Ann. Mus. Civ. Genova (2) xvii.–xxxviii. 1897, pp. 336–338. [2 new species.]

71. New Species of South American Eumolpidæ. Entom. xxx. 1897, pp. 168-170, 193–196, 216–218. [11 new species.]

72. Descriptions of Some New Species of Clythridæ and Eumolpidæ. Entom. xxx. 1897, pp. 261–264. [5 new species.]

73. A List of the Phytophagous Coleoptera obtained by Mr. H. H. Smith at St. Vincent, Grenada and the Grenadines, with Descriptions of New Species: Crioceridæ; Galerucidæ. Trans. Ent. Soc. London, 1897, pp. 249–376. [21 new species.]

74. List of the Phytophagous Coleoptera obtained by Mr. H. Raap in the Batu Islands, with Descriptions of the New Species. Ann. Mus. Civ. Genova (2) xviii.–xxxviii. 1897, pp. 405–411. [1 new genus, 5 new species.]

75. Further Contributions to the Knowledge of the Phytophagous Coleoptera of Africa, including Madagascar, I.–II. Proc. Zool. Soc. London, 1897, pp. 238–265, 527–577, pls. xvii. xxxiv. [10 new genera, 115 new species.]

76. Descriptions of some New Species of Phytophagous Coleoptera from India. Ann. Soc. Ent. Belg. xli. 1897, pp. 420–424. [6 new species.]

77. List of the Phytophagous Coleoptera obtained by Mr. W. L. Distant in the Transvaal, with Descriptions of the New Species. Ann. Mag. Nat. Hist. (7) i. 1898, pp. 344–360. [1 new genus, 13 new species.]

78. Descriptions of some New Species of Indian Phytophagous Coleoptera. Ann. Soc. Ent. Belg. xlii. 1898, pp. 185–190. [10 new species.]

79. New Species of Phytophagous Coleoptera from Australia and the Malay Regions. Ann. Soc. Ent. Belg. xlii. 1898, pp. 350–380. [4 new genera, 51 new species.]

80. On some Phytophagous Coleoptera (Eumolpidæ) from the Islands of Mauritius and Réunion. Trans. Entom. Soc. London, 1898, pp. 113–120. [6 new species.]

81. Additions to the Knowledge of the Phytophagous Coleoptera of Africa, I.–II. Proc. Zool. Soc. Lond. 1898, pp. 212–242, pl. xxii.; 1899, pp. 339–380, pl. xxi. [6 new genera, 93 new species.]

82. Descriptions of some New Species of *Doryphora*. Entom. xxxi. 1898, pp. 52–56. [7 new species.]

83. Descriptions of Eight New Species of South American Chrysomelidæ. Entom. xxxi. 1898, pp. 162–166. [7 new species, 1 new variety.]

84. Descriptions of New Species of South American Phytophagous Coleoptera. Entom. xxxii. 1899, pp. 247–250, 270–273. [13 new species.]

85. Some New Genera and Species of Phytophagous Coleoptera collected during Captain Bottego's last Expedition. Ann. Mus. Civ. Genova (2) xix.–xxxix. 1899, pp. 521–535. [2 new genera, 16 new species.]

86. Descriptions of Two New Species of Phytophagous Coleoptera from the Island of Nias. Ann. Mus. Civ. Genova (2), xix.–xxxix. 1899, pp. 625-627. [2 new species.]

87. Some New Genera and Species of Phytophagous Coleoptera from India and Ceylon. Entom. xxxii. 1899, pp. 67–70, 80–83. [1 new genus, 11 new species.]

88. Remarkable Position of Eyes of *Chalœnus*. Entom. xxxii. 1899, p. 98.

89. Descriptions of the New Species of Phytophagous Coleoptera obtained by Dr. Dohrn in Sumatra. Stett. Ent. Zeitg. lx. 1899, pp. 259–312, pl. [4 new genera, 62 new species.]

90. Bemerkungen über einige abnorme Structur-Verhältnisse einer Käfergruppe. Ins.-Börse, xvi. 1899, p. 46.

91. New Species of Phytophagous Coleoptera from Paraguay. Ann. Mus. Civ. Genova (2), xx.–xl. 1899, pp. 177–190. [16 new species.]

92. Descriptions of New Species and a New Genus of South American Eumolpidæ, with Remarks on some of the Genera. Trans. Ent. Soc. London, 1900, pp. 453–510. [1 new genus, 77 new species.]

93. On New Genera and Species of Phytophagous Coleoptera from South and Central Africa. Proc. Zool. Soc. London, 1900, pp. 203–266, pl. xx. [3 new genera, 98 new species.]

94. New Species of Indian Phytophaga principally from Mandar in Bengal. Mém. Soc. Ent. Belg. vii. 1900, pp. 95–140. [4 genera, 67 species.]

95. Descriptions of some New Species of Criocerini from the Malayan Region. Stett. Ent. Zeitg. lvi. 1900, pp. 382–388. [8 new species.]

96. Descriptions of Two New Species of *Hermesia* (Chrysomelidæ, fam. Eumolpidæ). Ann. Mus. Civ. Genova (2), xx.–xl. 1900, pp. 351–353. [2 new species.]

97. Descriptions of some New Species of Phytophagous Coleoptera of the Family Chlamydæ. Proc. Zool. Soc. London, 1901, pp. 153–164, pl. xiv. [14 new species.]

98. Descriptions of some New Genera and Species of Phytophagous Coleoptera from Madagascar. Ann. Soc. Ent. Belg. xlv. 1901, pp. 287–303. [3 new genera, 21 new species.]

(To be continued.)

DESCRIPTION OF A NEW PARASITIC BEE (*NOMADA*) FROM BORNEO.

By P. Cameron.

Nomada malayana, sp. nov.

Black; the thorax red, the second abdominal segment with a somewhat pyriform transverse white mark, broad and rounded on the inner side, gradually narrowed from the inner to the outer side: there is a broad transverse line on the fifth and sixth segments; base of

antennal scape, the terminal antennal joint, the anterior tarsi, and the apex of clypeus, rufous; mandibles of a paler rufous colour, their base tinged with yellow. Wings hyaline, their apex with a narrow cloud; the stigma dark fuscous, the nervures black. ♀. Length, 5–6 mm.

Kuching, Borneo (John Hewitt, B.A.).

Face, front, pleuræ, and lower half of the sides of metanotum broadly covered with white pubescence. Head and thorax closely, distinctly punctured, the former more strongly than the latter. Metanotal area clearly defined, broadly roundly narrowed behind, closely reticulated, its centre black. Legs covered thickly with white pubescence; the calcaria white. The first transverse cubital nervure is sharply, obliquely sloped from below the middle in front; the shorter posterior part is less steeply, obliquely sloped; the second is broadly roundly curved outwardly; the first recurrent nervure is received near the base of the apical fourth of the cellule. Abdomen very smooth and shining, the apical margins of the segments not depressed. The clypeus is more strongly punctured than the front, its apex is a little raised; narrowly rufous, there being also a wider rufous line down the centre. There is no keel between the antennæ.

A distinct species.

NOTES AND OBSERVATIONS.

Meconema varium; a Correction.—In the 'Entomologist' for November, 1880, p. 252, the little leaf-cricket bred from the galls made on the oaks by *Cynips kollari*, and which Mr. Bignell saw emerge in the month of May, were, as is evident from the spotted legs of the one that has served for illustration, the young of *Odontura punctatissima*, said to frequent oak-trees, and not those of the verdant *Meconema varium* found on limes and on rose-bushes. This mistake has taken its origin from a remark made by Leopold Fischer in his 'Orthoptera Europæa,' p. 241. I have found both these little creatures in the garden here in Devonshire at the close of the year.—A. H. Swinton; Totnes.

[Whether the Orthoptera bred from galls of *Cynips kollari* were *Meconema varium* or *Leptophyes punctatissima*, they were in either case Locustid grasshoppers and not crickets. As regards the full-grown grasshoppers, *L. punctatissima* is spotted, or rather irrorated, while *M. varium* is not. But these specimens were so young that unless both species had been bred from the egg and we could make a comparison, it would scarcely be safe to say that Fitch (who wrote the article) is wrong. Possibly, too, Bignell may have bred them through. *Meconema varium* is very common on oaks in the New Forest; it would fare badly there for lime-trees. *L. punctatissima* is generally found on low-growing plants. Still the spotted appearance of the insect figured leads one to suspect *L. punctatissima*.—W. J. L.]

GENITALIA OF THE BRITISH NOCTUIDÆ. — We have received intimation that Mr. F. N. Pierce, F.E.S., is about to publish a work under the above title. As practically the genitalia of all the British species of Noctuidæ have been examined by Mr. Pierce, and as drawings of these will be given, the work should be indispensable to entomologists. The cost of production will be considerable no doubt, and the author, who proposes to issue the book at the low figure of five shillings, will be glad to secure as large a number of subscribers as possible. His address is The Elms, Dingle, Liverpool.

CAPTURES AND FIELD REPORTS.

MAMESTRA (HADENA) GLAUCA AND ACRONYCTA MENYANTHIDES IN GLAMORGAN.—While looking for *Macrothylacia rubi* on May 22nd, 1907, on the hills between Merthyr and Aberdare, I came upon two fine specimens of *M.* (*H.*) *glauca* sitting on a clump of heather. Further searching on subsequent occasions produced a few more specimens resting on an old wall which runs across the hill. In May of this year several specimens of the insect were again taken in the same place, and while searching for it on June 6th in another locality on the same hill I found both it and several fine specimens of *A. menyanthides* sitting on heaps of stones which are scattered over the mountain side. Other specimens of the latter species were observed at intervals up to June 20th. I am not aware that either of these species has been taken previously in this district.—G. FLEMING; 9, Fairview Terrace, Merthyr Tydfil.

LARVÆ OF CIRRHŒDIA XERAMPELINA HATCHING IN DECEMBER. —From some ova of *C. xerampelina*, which I had kept outdoors under usual conditions, larvæ hatched out on the 13th inst. Is not this unusual, seeing that the ash-buds at present are very small and apparently too hard for such young larvæ to penetrate? On 10th inst. I took (here) a larva of *Lasiocampa quercus*; it was unusually active, and crawling across a sunny doorstep.—HERBERT W. BAKER; 73, Limetree Place, Stowmarket, Suffolk, December 12th, 1908.

PIERIS BRASSICÆ IN DECEMBER.—On December 16th I found a number of larvæ of *P. brassicæ* feeding on cabbage in my garden here. —W. JARVIS; 22, Leicester Road, Lewes, Sussex.

[Our correspondent kindly sent half a dozen of these larvæ, one or two of which were then nearly full grown, and have since pupated. It will be remembered that Mr. Frohawk (Entom. xli. 39) recorded three larvæ of *P. brassicæ* at Rayleigh, Essex, on January 4th, 1908.]

PIERIS RAPÆ IN DECEMBER.—I have an evidently fresh specimen of *P. rapæ*, which was captured on December 10th of this year. This seems to be a most extraordinary time of year for this butterfly to be on the wing, and I can only account for it by the fact that we have had such a phenomenally mild autumn, though I have not heard of other examples having been seen. I may add the butterfly is still alive (December 15th, 1908). — GEOFFREY MEADE-WALDO; Hever Warren, Hever, Kent.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, Nov. 18th*, 1908.—Mr. H. Rowland-Brown, M.A., Vice-President, in the chair. —Dr. Millais Culpin, M.B. (Lond.), F.R.C.S., of the Palace Hotel, Shanghai: Mr. E. M. Eustace, of Challacombe Rectory, Parracombe, R.S.O., North Devon; Captain F. H. Hardy, R.A.M.C., Medical Officer of the British Central Africa Protectorate; Mr. Jens M. A. Knudsen, of Noerre Nebel, Denmark; Captain Leonard Paul, of Brook House, Eastry, S.O., Kent; and Mr. B. C. S. Warren, of The Avenue, Amersham, Bucks, were elected Fellows of the Society.—Mr. E. C. Bedwell exhibited examples of the rare weevil *Procas armillatus*, taken in Sherwood Forest in 1908; and specimens of *Phyllobius argentatus* and *P. maculicornis* with deciduous mandibles attached.—Mr. P. de la Garde sent for exhibition specimens of the following new and rare Coleoptera:—*Laccobius purpurascens*, Newbery, recently described as new to science; *Ceuthorrhynchus parvulus*; and *Phyllotreta diadema*ta, recent additions to the British list; *Arena octavii*, *Sibinia sodalis*, *Neuraphes longicollis*, *Cardiophorus equisiti*, rare and local species; and a species of *Choleva*, right-hand maxillary palpus in triplicate.—Mr. W. S. Sheldon exhibited a specimen of *Anthrocera achilleæ*, from Oban, one of those taken by Mr. Renton and recently recorded as British, with forms of the species from the South of France; and of *A. filipendulæ* and *A. exulans* from Scotland, for comparison.—Mr. R. M. Prideaux, a gynandromorphous specimen of *Lycæna zephyrus* var. *lycidas* from the Simplon, taken in July last; an example of *Chrysophanus alciphron* var. *gordius* ab. female *midas*, Lowe, from below Salvan in the Rhone Valley; and a striking aberration of *Melitæa didyma* with the spots of the lower wings coalescent in thick splashes, captured near Bérisal in July, 1905.—Mr. A. Harrison, the resulting series obtained by cross pairings of successive broods of *Pieris napi* var. *bryoniæ*. He said that as a demonstration of Mendelian proportions they were quite negative. So far it would appear that the *bryoniæ* characters were not transmitted by the male, but in an exaggerated degree by the female.—Mr. L. W. Newman read a note on the life-history, and exhibited examples, of the imago of *Polygonia c-album*. He said that his observations led him to conclude that the first twelve to twenty ova laid by the hybernated females are the only ova which produce the var. *hutchinsoni*, and that this variety is the only form which pairs and produces the second brood.—Dr. Karl Jordan exhibited examples of *Charaxes zoolina*, and its nearest allies *C. betsimiseraka* and *betanimena* from Madagascar, *zoolina* and *neanthes* from East Africa, *phanara* and *ekinkei* from West Africa, and *kahldeni* and *homeyeri* from West Africa. This exhibit confirmed the result of Mr. G. F. Leigh's breeding experiment mentioned by Professor E. B. Poulton at the last meeting.—Dr. F. A. Dixey, specimens of the genera *Colaenis*, *Heliconius* and *Pereute*, to illustrate a mimetic relation between *C. telesiphe*, Hew., *H. telesiphe*, Doubl., and *P. antodyca*, Boisd.—The Rev. G. Wheeler, a pair of *Melitæa dictynna* var. *dictynnoïdes* Horm., received from Herr Hormuzaki. They are the converse of *M. britomartis*, having the upper side of *dictynna* but the under much nearer to *parthenie*. This form is usually described as a

var. of *aurelia*, Nick., but as almost typical *aurelia*, a specimen of which was exhibited, are found at the same place, Mt. Cecina, near Czernowitz, Bukowina, this seems unlikely.—Mr. Edward Meyrick B.A., F.R.S., communicated a paper entitled "Descriptions of Micro-Lepidoptera from Bolivia and Peru."

December 2nd, 1908.—Mr. C. O. Waterhouse, President, in the chair. —Mr. Sydney Douglas Crompton, of Carlton House, Kew Gardens, S.W., and Mr. W. Parkinson Curtis, of Aysgarth, Poole, Dorset, were elected Fellows of the Society.—Mr. H. W. Andrews exhibited some examples of predaceous Diptera and their victims, taken during the year; and a specimen of *Bassus lætatorius*, Fab., female, bred from a pupa of the dipteron *Syrphus balteatus*, Dej.—Professor T. Hudson Beare and Mr. H. St. John Donisthorpe brought for exhibition specimens of *Olophrum assimile*, Payk., a beetle new to the British fauna, taken by them in September, 1908, at Nethy Bridge. Mr. Donisthorpe also showed examples of *Trechus longicornis*, Stm., from Kelton, near Dumfries; and of an *Anaspis*, either referable to *septentrionalis*, Champion, or new to the British list, taken in woody fungus at Nethy Bridge, this being probably the third specimen discovered.—Mr. G. C. Champion expressed his opinion that the *Anaspis* in question did not belong to the species described by himself or by Schilsky, but was *A. melanostoma*, an identification rejected by the exhibitor on account of the male characters.—Mr. G. T. Porritt exhibited forms of *Abraxas grossulariata* bred from wild Huddersfield larvæ during the past year, with two males of the var. *varleyata*, showing how wide a range of variation there is, even in the variety.—Mr. L. W. Newman also exhibited an extreme form of *varleyata*, the whole of the fore wings being coal-black, and only a very narrow white band on hind wings.—Mr. W. J. Kaye exhibited a fine series of *Heliconius* species from Mapiri River, North Bolivia, to show the close parallel variation between the very variable forms of *melpomene* with the equally variable forms of *phyllis*. Mr. R. J. Beck brought for exhibition variant forms of *Adalia bipunctata* L., from Alton and Farnham; examples of *Lixus paraplecticus* taken on *Sium angustifolium*, resembling small pieces of driftwood; and a specimen of *Leptura sanguinolenta*, taken at Southampton, by sweeping Umbelliferæ.—Mr. W. Schmassman showed a case containing specimens of *Pyrameis atalanta*, which had been subjected in the pupal stage to various degrees of temperature.—Mr. F. Merrifield exhibited, on behalf of Mr. Reuss, of Ware, Herts, a remarkable aberration of *Aglais urticæ*, bred in October, 1906, from wild autumn larvæ, the pupa being exposed to the direct rays of the sun; and interesting as showing the transition of one form of *Vanessa* markings to the other. —Dr. F. A. Dixey, specimens of South American and African butterflies, remarking that since the last meeting Mr. W. F. H. Rosenberg had kindly furnished him with fresh evidence tending to show that *Colaenis telesiphe*, though cryptically coloured beneath, was at least as common as *Heliconius telesiphe*, and was therefore not likely to be a Batesian mimic of that species. He added that *Belenois thysa*, which had often been spoken of as a Batesian mimic of *Mylothris agathina*, had been found by Mr. H. W. Simmonds to be much commoner at Berea, Durban, than its model. This confirmed an observation made by Dr. Longstaff and the speaker at Congella, near Durban, in 1905.—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society.—*November 12th*, 1908.—Mr. Alfred Sich, F.E.S., President, in the chair.—Mr. P. N. Baker, of Stratford, was elected a member. —Mr. Kaye exhibited bred and captured series of *Melitæa aurinia* from Kent; the former, large and of vivid colour, were reared in a humid orchid house, and were referable to var. *provincialis*.—Messrs. Harrison and Main, several extensively xanthic specimens of *Epinephele jurtina* (*janira*) taken in North Cornwall.—Mr. R. Adkin, a series of *Coremia ferrugata*, bred from ova; the larvæ were fed on common *Galium*, and would not touch ground ivy.—Mr. H. Moore, specimens of the tsetse-fly (*Glossinia palpalis ?*) from near Lake Chad, one of the mediums of the terrible "sleeping sickness."—Mr. Newman, a series of the hybrid *Smerinthus ocellata-populi*, bred in August, 1908, from a pairing in June, 1908, including two perfect gynandromorphs; and also a rayed specimen of *Abraxas grossulariata* ab. *varleyata*, female bred on November 11th, a second-brood specimen.—Mr. West (Greenwich), a series of the rare and recently discovered species *Aleochara crassiuscula*, taken at Lewisham, a new locality.—Mr. Main, a series of photographs of the life-history of *Pieris brassicæ*.—Dr. Hodgson and Mr. Grosvenor, a long series of *Anthrocera trifolii*, illustrative of their recent investigation of the species, and including, among other forms, some dozen fine ab. *obscura*.—Mr. Coote, a specimen of a third brood of *Celastrina argiolus*, bred on October 18th from a September larva.—Mr. Smith, a bred melanic example of *Cleora glabraria* from the New Forest.— Mr. H. J. Turner, a considerable number of species of Lepidoptera taken in Switzerland (Zermatt, Vissoye, Binn, and Saas Fée) by Dr. Chapman, including a small race of *Erebia ceto*, *E. mnestra*, *E. gorge*, *E. lappona*, *Œneis aëllo*, very silvery *Argynnis niobe*, a three-spotted female of *Epinephele lycaon*, and a curious aberration of *Brenthis euphrosyne*. The remainder of the evening was devoted to the exhibition of lantern slides by Messrs. Dennis, West (Ashstead), Tonge and Main.—Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society. — *November 4th*. — Mr. R. G. Benton exhibited *Tryphæna comes* with hind wings clouded with black, Folkestone, July, 1908. — Mr. G. G. C. Hodgson, *Pieris rapæ* bred from Redhill larvæ, the pupæ having been subjected to alternate spells of high and low temperatures; the imagines showed an intensification of the yellow coloration on the under sides, thus resembling Scotch specimens.—Mr. L. W. Newman, a long series of hybrids from *Smerinthus ocellatus* male and *S. populi* female, the percentage of females being very small. Rev. C. R. N. Burrows stated that an examination of the genitalia showed that while the males were fully developed, the females were gynandromorphous. —Mr. A. E. Tonge, a specimen of *P. brassicæ* from Surrey, with a partial narrow black border on the hind wings.—S. J. Bell, *Hon. Sec.*

Lancashire and Cheshire Entomological Society. — The opening meeting of this Society was held on October 19th, at the Royal Institution, Colquit Street, Liverpool, Mr. William Mansbridge, Vice-President, in the chair. The meeting was exhibitional in character, the members showing results of the season's work.—

Mr. Robert Tait, Jr., brought a long series of *Agrotis agathina* bred from Welsh larvæ, and noted that the red form occurred much more frequently among wild imagines than among moths bred at Manchester from larvæ taken on the same ground earlier in the year. From the Isle of Wight, fine species of the following:—*Agrotis lunigera*, *A. cinerea*, *Acidalia humiliata*, *Setina irrorella*. From Pendine, South Wales:—*Boarmia repandata* var. *conversaria*, *Callimorpha dominula*. From Lakeside:—*Numeria pulveraria*, *Tephrosia consonaria*, and a very long series of *S biundularia*, varying from almost white to the extreme form of var. *delamerensis*. Mr. Tait stated that he had bred a partial second brood of the following species, viz.:—*B. repandata* var. *conversaria*, *Aplecta herbida*, and *A. humiliata*, a living example of which he exhibited at the meeting. —Mr. Mounfield, of Warrington, showed a fine series of *Lithosia sericea*, and *Leucania pallens*, a red variety from Warrington; *Macaria liturata* var. *nigrofulvata*, a short series from Delamere Forest. —Mr. Robinson, of Warrington, also exhibited *L. sericea*, as well as *Hydræcia petasitis*, *H. lucens*, *H. nictitans*, *H. paludis*, *Hadena glauca*, *Orthosia suspecta*, *Agrotis nigricans*, and *Acronycta leporina* var. *melanocephala*, all from Warrington and neighbourhood; while from Delamere Forest he showed *Aplecta nebulosa* var. *robsoni* and *Lithosia mesomella*.—Mr. T. Baxter, of St. Anne's, sent a long series of *Abraxas grossulariata* and varieties, from St. Anne's, and short series of *Polia chi* vars., including *olivacea* and melanic forms from Yorkshire; also strongly marked typical specimens of this variable moth from Barmouth.—Dr. Edwards had series of *Abraxas sylvata* and *Noctua glareosa*, from Carnarvon; *Eupithecia pulchellata* from the Lake District; *Dasychira fascelina*, from Formby; *Celæna haworthii* and *Luperina cespitis*, from Delamere Forest.—Mr. Prince sent several boxes of local insects, including a very long series of *Nyssia zonaria*.—Mr. H. R. Sweeting exhibited *Aplecta nebulosa* and var. *robsoni*, and *Boarmia repandata*, from Delamere; *Cucullia asteris*, from Essex; *Moma orion*, bred from New Forest pupæ which had laid over two winters.—Mr. W. J. Lucas, of Kingston-on-Thames, sent a number of excellent photographs of Lepidoptera.—Dr. Bell had several varieties of *Bombyx quercus* from Wallasey, including the olive variety; Dr. Bell stated that the larvæ from which the olive forms were bred were black with very dark brown hairs; this had also been noted by other collectors, and was supported by a further exhibit, by the same member, of young larvæ from olive parents, and from typical parents in which this difference was well seen.—Mr. Mallinson brought a specimen of *Deilephila galii*, bred from one of the two larvæ found at Wallasey, September, 1907.—Mr. W. Mansbridge exhibited a series of *Aplecta nebulosa* var. *robsoni*, very dark grey forms, and var. *pallida*, bred 1908; *Polia chi* var. *olivacea*, from near Leeds; and stated that this form had increased from about five per cent. noted in 1890-1, to about twenty per cent. noted this year. A series of black *Boarmia repandata*, from Knowsley, Lancashire, and a male *Porthesia similis*, from Simonswood, without the black spots on the hind margin of the fore wings; a short series of *Peronea permutana*, from Wallasey.—H. R. Sweeting & Wm. Mansbridge, *Hon. Secs.*

RECENT LITERATURE.

1. *Three Related American Species of Æschna (Odonata)—Æ. multicolor*, Hag., *Æ. mutata*, Hag., and *Æ. jalapensis*, nov. sp.
2. *A New Dragonfly (Odonata) belonging to the Cordulinæ, and a Revision of the Classification of the Subfamily.* [The new species is *Platycordulia xanthosoma*.] Both by E. B. Williamson, 'Entomological News,' June, July, and November, 1908.

Probably the general notes embodied in these two papers will be of most interest to English readers.

W. J. L.

The Annals of Scottish Natural History. Edinburgh. 1908.

Not a great amount of entomological matter appears this year, but some of the articles and notes are of importance. These are—Notes on Coleoptera of St. Kilda (T. H. Beare); do.: mainly from Birds' Nests (N. H. Joy); Scottish Species of Oxyura (Proctotrypidæ), pt. iii. (P. Cameron); Lepidoptera of East Ross, &c., and on *Amblyptilus punctidactylus* (D. Jackson); Insect Fauna of Isle of May (P. H. Grimshaw); *Sirex noctilio* (Sawfly) in Forth, *Aleochara spadicea* (Coleopteron) in Scotland, *Quedius longicornis* (Coleopteron), in Forth, and *Bethylus cephalotes* (Proctotrypidæ) in Scotland (W. Evans); Death's Head in Kircudbrightshire (R. Service); *Palloptera ustulata* in Edinburgh and *Ceratophyllus borealis* in Berwickshire (J. Waterston).

W. J. L.

Descriptions of Tertiary Insects. By T. D. A. Cockerell. (From 'The American Journal of Science,' vol. xxvi. pp. 69–75, July, 1908.)

These descriptions are illustrated by figures of three fossil dragonflies—*Lithagrion hyalinum*, Scudder, *Enallagma florissantella*, sp. nov., and *Trichonemis aliena*, Scudder.

Some Results of the Florissant Expedition of 1908. By Professor T. D. A. Cockerell. (Reprinted from 'The American Naturalist,' vol. xlii. pp. 569–81, September, 1908.)

Some of the most interesting fossils found in 1908 in the Florissant beds are discussed and illustrated by photographs. Among these are a dragonfly (*Phenacolestes parallelus*, Ckll.), and two bees (*Calyptapis florissantenis*, Ckll., and *Anthophora melfordi*, Ckll.).

The Agricultural Journal of India. Vol. iii., parts 1 and 2. Calcutta and London: Thacker & Spink and W. Thacker & Co. 1908.

The contents of part i. (January, 1908) comprises an article by H. Maxwell-Lefroy, M.A., the Imperial Entomologist, on "The Tobacco Stem Borer (*Gnorimoschema heliopa*, Low.)." This is accompanied by an excellent coloured plate showing the insect in all stages.

In part ii. (April, 1908) the principal entomological contribution is that by M. Mackenzie and H. Maxwell-Lefroy, entitled "The Sugar-cane Borers of Behar." These borers are the larvæ of moths that attack the sugar-cane. Two species, *Scirpophaga auriflua* and *S. monostigma*, injure the shoots. Four others—*Chilo simplex*, *C. auricilia*, *Nonagria uniformis*, and *Anerastria abutella*—are described as "side-borers." The larva of *Polyocha saccharella* destroys the roots, and seems to be capable of causing more permanent mischief than either of the other "borers." All the moths, together with ova, larvæ, and pupæ, are well figured in colour on plate xx., and the methods of larval attack are shown on plates xxi. and xxii.

Memoirs of the Department of Agriculture in India. Vol. ii., Nos. 1, 2, 6. Calcutta and London: Thacker & Spink and W. Thacker & Co.

No. 1 (April, 1908, pp. 1–13). "The Rice Bug (*Leptocorisa varicornis*, Fabr.)." By H. Maxwell-Lefroy, M.A. The perfect insect and various stages from the egg are depicted in colour on plate i.

No. 2 (April, 1908, pp. 14–46). "Remarks on Indian Scale Insects (Coccidæ)." Part iii. By E. E. Green, F.E.S. Plates ii.–iv.

No. 6 (August, 1908, pp. 95–110). "The Cotton Leaf-roller (*Sylepta derogata*, Fabr.)." By H. Maxwell-Lefroy, M.A. The moth and its early stages are shown on plate ix., which is well executed in colour.

United States Department of Agriculture. Bureau of Entomology :—

Bulletin No. 64, pt. iv.: "An Injurious North American Species of Apion, with Notes of Related Forms." By F. H. Chittenden. Pt. v.: "Insects Injurious to the Loco Weeds." By F. H. Chittenden, Sc.D.

Bulletin No. 68, pt. vi.: "Grape Root-worm Investigations in 1907." By Fred Johnson. Pt. vii.: "Demonstration Spraying for the Codlin Moth."

Bulletin No. 75. pt. iii.: "Bee Diseases in Massachusetts." By Burton N. Gates.

Technical Series, No. 15: "A Revision of the Ixodoidea, or Ticks, of the United States." By Nathan Banks (June, 1908). No. 16, pt. i.: "The National Collection of Coccidæ." By C. L. Marlatt, M.S. (April, 1908). Pt. ii.: "New Species of Diaspine Scale Insects." By C. L. Marlatt, M.S. (August, 1908). No. 12, pt. vi.: "A Record of Results from Rearings and Dissections of Tachinidæ." By C. H. T. Townsend (September, 1908).

Report of the Entomological Department of the New Jersey Agricultural College Experimental Station, New Brunswick, N. J. By John B. Smith, Sc.D. For the year 1907. Trenton: MacCrellish Quigley. 1908.

Obituary.—We are very grieved to announce the death of Mr. J. A. Clark. A further notice will appear in the February number.

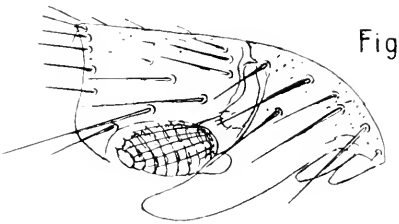

Fig. 1.

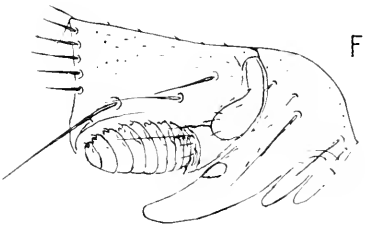

Fig. 2.

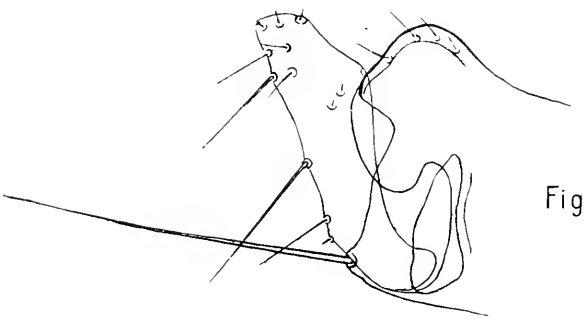

Fig. 3.

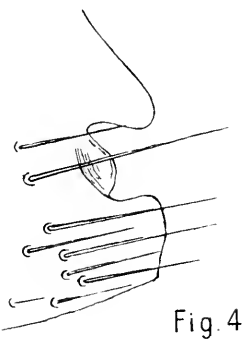

Fig. 4.

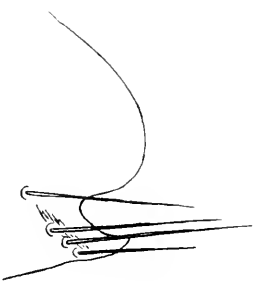

Fig. 5.

K.J. del. West, Newman proc.

FIVE-COMBED BAT-FLEAS (*NYCTERIDOPSYLLA*).

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NOTES ON THE FIVE-COMBED BAT-FLEAS FORMING THE GENUS *NYCTERIDOPSYLLA*,* OUDEMANS.

BY THE HON. N. C. ROTHSCHILD, M.A., F.L.S., F.E.S.

(PLATE I.)

IN the December number of the 'Entomologist' for 1908, p. 281, we described a new species of five-combed bat-flea under the name of *Nycteridopsylla longiceps*, comparing it with another British species which we identified at that time as *pentactenus*, Kolenati. Our identification was based on specimens from Kolenati's collection preserved in the Vienna Museum, with which the British ones agree fairly well. This identification has now proved to be erroneous, and we think therefore that a general survey of all the known species of the genus *Nycteridopsylla* may be attempted with advantage.

1. *Nycteridopsylla pentactenus*, Kol.

Ceratopsyllus pentactenus, Kol., Parasiten der Chiropteren, p. 32, no. 3 (1856, Brünn).

C. tetractenus, Kol., Parasiten der Chiropteren, p. 32, no. 4 (1856, Brünn); *id.*, Hor. Soc. Ent. Ross. vol. ii. p. 39 (1863).

Nycteridopsylla pentactena (!), Oudemans, Tijdschrift voor Entomologie, Verslag, p. lix (1906); Dampf, Schrift. Phys.-ökon. Ges. vol. il. p. 42 (1908, Königsberg).

Kolenati originally described two species in 'Die Parasiten der Chiropteren' under the names of *pentactenus* and *tetractenus*, which he subsequently united under the latter name in the 'Horæ Societatis Entomologicæ Rossicæ.' The description and figure are insufficient, but two characters are mentioned which refer to this species only. In the 'Parasiten der Chiropteren' Kolenati states, under *pentactenus*, that the second segment of

* *Nycteridopsylla*, Oudemans, Tijdschrift voor Entomologie, Verslag, p. lviii (1906).

the antenna bears six long bristles, while in the 'Horæ' the six bristles placed before the eye are noted as a character. In the specimens kindly forwarded to us by Dr. Oudemans there are five or six long bristles on the second segment of the antenna, while in the other two species of *Nycteridopsylla* there are only one to three of these long bristles. The second character, again, applies only to this species. We therefore concur with Dr. Oudemans in identifying this insect with *N. pentactenus* of Kolenati.

N. pentactenus is easily recognized by the head (Pl. I. fig. 1, ♂), the long bristles of the body, and the modified segments. The metathoracical sternite bears near the posterior edge a bristle which nearly reaches to the hind edge of the epimerum. The dorsal bristles of the thorax and abdomen are rather shorter than the lateral ones, while in the males of *eusarca* and *longiceps* the dorsal ones are prolonged. Dampf has given a fairly correct figure of the clasper of the male. The ninth sternite resembles that of *longiceps* (*cf.* Entom. 1908, Pl. VIII.), but the distal portion is more curved upwards, somewhat resembling the runners of a sleigh. The seventh abdominal sternite of the female is represented on our Plate (fig. 5). This sternite differs very essentially from that of the allied species. It has one sinus on each side, the lobe above the sinus being very broad and strongly rounded, while the lower lobe is narrow.

Dr. Oudemans obtained this species off *Vesperugo serotinus* at Arnheim, in Holland. There are no examples of it among those of Kolenati's specimens preserved in the Museum at Vienna, nor have we seen it from any other collection, with the exception of a single male example received from the Hazai Zoologiæ Laboratorium at Budapest, taken off *Plecotus auritus* in Hungary on December 15th, 1908. The species, however, may be expected to occur in Great Britain.

2. *Nycteridopsylla eusarca*, Dampf.

Nycteridopsylla eusarca, Dampf, Schrift. Phys.-ökon. Ges. vol. xlviii. p. 398 (1908, Königsberg); *id.*, *l. c.* vol. il. p. 45, fig. 3 (1908).

The head (Pl. I. fig. 2, ♂) bears only two long bristles on the frontal portion, and the club of the antenna is longer than in *pentactenus*. The dorsal bristles of the thorax and abdomen are prolonged in the male. The modified segments of both sexes are quite different from those of *pentactenus*. The non-movable process of the clasper of the male is short and broad, the apex being rounded, except on the distal side. The finger is much broader than in *pectactenus*, being widest above the centre. The seventh abdominal sternite of the female has a double sinus on each side as shown in Pl. I. fig. 4. The lobes of this sternite do not actually lie in one plane, as represented in the figure; the sinus therefore does not appear so large in an unmounted speci-

men as in a mounted (flattened) one. The size of the lobes varies somewhat in different individuals.

Kolenati's specimens in the Vienna Museum belong to this species. *N. eusarca* is widely distributed, and apparently the commonest of the five-combed bat-fleas. It appears to vary geographically, as the specimens before us from different countries do not exactly agree with one another. The material, however, from the Mediterranean countries which we have is quite insufficient to decide such a delicate point, and we therefore can at present establish but two geographical races.

(*a*) *Nycteridopsylla eusarca eusarca*, Dampf, *l. c.*

The author of *eusarca* has kindly given me in exchange a male and female of this form. These two specimens show that Dampf must have made a mistake when he especially stated that the head of *eusarca* did not bear any bristles along the posterior edge. All our specimens of this species have a row of bristles in that place, as in the allied species (Pl. I. fig. 2). The movable finger of the clasper of the male is rather broad, being but slightly narrowed towards its base. The eighth tergite of the male has three long bristles at the upper edge between the stigma and the apical margin, besides a few shorter ones on the side.

We have no specimens exactly agreeing with this form except the pair of co-types from East Prussia. A series of Austrian specimens are intermediate between *N. e. eusarca* and the British form described below, these Austrian specimens having the same small size as *N. e. eusarca*, while in the modified segments of the male they approach the British subspecies.

(*b*) *Nycteridopsylla eusarca major*, subsp. nov.

Ceratopsylla pentactenus, Saunders (nec Kolenati, 1856, err. determ.), Ent. Mo. Mag. (2), vol. iii. p. 66 (1892).

Nycteridopsylla pentactenus, Rothschild (nec Kolenati, 1856, err. determ.), Entom. vol. xli. p. 281 (1908).

Both sexes are distinctly larger than in *N. e. eusarca*. The eighth tergite of the male bears four long bristles at the dorsal edge distally to the stigma; the movable finger of the clasper, though varying somewhat in individual specimens, is always strongly widened above the centre on the proximal side (Pl. I. fig. 3); the non-movable process, moreover, is broader than in *N. e. eusarca*. The tibiæ have a few more lateral bristles on the inner and the outer side in both sexes. The lower lobe of the seventh sternite of the female is on an average broader than in Continental specimens.

We have three males off *Scotophilus noctula*, obtained by Dr. D. Sharp at Cambridge in January, 1892, and one male and five females from the same locality and host collected by Mr.

William Farren in 1900 and 1903. This species appears to be local in the British Islands. We have not found it or heard of it being taken on Noctules from any locality other than Cambridge.

3. *Nycteridopsylla longiceps*, Rothsch.

Ceratopsylla pentactenus, Rothschild (nec Kolenati, err. determ.), Novit. Zoolog. vol. ii. p. 66 (1895); *id.*, *l. c.* vol. v. p. 542 (1898).

Nycteridopsylla longiceps, Rothschild, Entom. xli. p. 281 (1908).

This species, when originally described in the 'Entomologist,' was, as stated above, compared with *N. eusarca major*, that form being then erroneously identified as the true *pentactenus*. The male of the present species can be recognized at once by the great length of the head. In the female, however, this difference is not so apparent, as in *eusarca* the length of the head is considerably greater in the female than in the male. The modified segments of both sexes of *longiceps* are very distinctive taxonomic characters. In the male the movable finger of the clasper is very broad, and the apex of the ninth sternite is very much more obtuse than in *N. eusarca*. The seventh sternite of the female has but a single sinus on each side, the lobe above the sinus projecting far less than the one below it.

We have received examples of this species from Great Britain, Firenze (Italy), and from Adana (Asia Minor). In fact, it appears to be the only member of the genus which is fairly widely distributed in the British Islands. Our British specimens have been collected from the following hosts: *Scotophilus pipistrellus*, *Plecotus auritus*, and *Vespertilio nattereri*.

4. *Nycteridopsylla bouchei*, Oud.

Nycteridopsylla bouchei, Oudemans, Tijdschrift voor Entomologie, Verslag, p. lix (1906).

Pulex vespertilionis, Bouché, Nov. Acta Acad. Leop. Carol. xvii. i. p. 508 (1835).

? Typhlopsylla hexactenus, Tasch., Die Flöhe, p. 89 (1880).

Dr. Oudemans renamed *Pulex vespertilionis* of Bouché under the above name, stating that he considers this insect to belong to his new genus *Nycteridopsylla* on account of its possessing an eye. In Bouché's original description no reference is made to an eye at all, and we are inclined to think that Taschenberg was correct in considering Bouché's species to be identical with *hexactenus* of Kolenati. Dr. Oudemans, however, is correct in rejecting the name *vespertilionis*, as it had previously been employed by both Curtis* and by Dugès.†

* *Ceratophyllus vespertilionis*, Samouelle, in Curtis, Brit. Ent. vol. ix. No. 417 (1832), though Samouelle never described or mentioned any *Pulex vespertilionis*.

† *Pulex vespertilionis*, Dugès (nec Bouché), Ann. d. Scienc. Nat. vol. xxvii. p. 161 (1832).

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By George Wheeler, M.A., F.E.S.

(Continued from p. 7.)

There are three principal directions in which the species of this group tend to vary, *viz.* size, the distribution of the usual colouring, and the approach on the upper side to the more variegated *Aurinia*-group. The first of these has already been touched on and in some cases accounted for, nor has it, taken alone, given rise to any varietal name, except in the one (probably mistaken) case of *varia*. Other sources of variation are the shape of the wings, which in some cases appears to be a local peculiarity, and the occasional approach on the under side to the *Cinxia*-group, which seems to be purely aberrational in character. Of the remaining directions of variation the approach on the upper side, especially in the female, to the *Aurinia*-group is perhaps the more widely interesting, but being in most cases by far the less conspicuous, it has not figured so largely as a cause of named varieties, and more particularly aberrations, as the unusual distribution of the ordinary colouring, and it is to the named forms that I wish now to direct attention. As a matter of personal opinion, I regard it as a somewhat unnecessary overloading both of the memory and of the "variety" list to name every intermediate form, though no doubt it serves here and there to recall to the minds of entomologists the names of some who have done valuable work which might otherwise be in danger of being forgotten—I allude to the *work* not the *names*; but on the whole it would seem better if extreme forms only were named, and intermediates merely regarded as "transition to so-and-so," or if all aberrant forms were called by the name of the well-marked form they most nearly resemble, and towards which they tend, without regard to the actual extent of the individual aberration. But as this is now far past hoping for, so many names having already been given, some of them a very long time back, it is at any rate as well that we should know the forms to which the names really apply, a knowledge which can only be gained by reference to the original descriptions; though it is still quite permissible to refer to the same name forms nearly resembling the originals, especially in the case of those that are rather aberrational than varietal in character. One can hardly help feeling that in general the desire to possess named varieties, and the love of writing "mihi," or seeing one's own name quoted, after the name of an insect, is more often responsible for the constant accumulation of aberrational names than any more scientific cause; and this accumulation has increased vastly since the time when Kingsley made such game

of the subject in the 'Water-Babies,' where he says that if the Professor's dignity had allowed him to examine Tom instead of throwing him back into the water, he would have given him two long Latin names, the first of which would have told a little about Tom and the second all about himself, as of course he would have called him "Hydroteknon Ptthmllnsprtsianum." It was a good skit then—it would be a better now.

Athalia, being by far the most generally distributed and perhaps also the most variable of the group, has naturally given rise to the largest number of named forms. We will take first those which depend on the unusual grouping of the ordinary black and fulvous of the upper side, a peculiarity usually, though not always, associated with more or less abnormality on the under side. The majority of these forms may be divided into two groups: in the first the fulvous, in the second the fuscous colour prevails.

In the first group the oldest named form appears to be ab. *corythalia*, Hübner, 'Beiträge,' vol. ii. pt. ii. tab. 3, *S*, *a*, *b* (1790).

In the remarks he makes on the illustration (p. 51) he expresses a doubt as to whether it is a good species or an aberrant form of *athalia*. He gives no description of it, but refers to the illustration in which both upper and under side are shown, and from which the following description is made:—

Up. s. f. w.: Mostly fulvous; a broad black border, to which the outer subterminal line appears to be joined, as there are no lunules; the inner subterminal narrow; the upper part of the elbowed line wanting; stigma black, triangular: two triangular black patches at the base, one on each side of the median nervure.

Up. s. h. w.: Blackish, except for one row of fulvous spots near the border.

Un. s. f. w.: Tip yellow, the rest of the wing fulvous, but with three short black dashes representing the costal part of the elbowed line, and a row nearer the base; the outline of the stigma and the space between the basal lines each contain darker colouring; below there is a basal dash.

Un. s. h. w.: Outer half pale yellow, inner half fulvous, divided by a strong black line; the light spot apparently replaced by a black one, and all the spots of the basal band black; outer band represented by a row of five orange spots, the central part being unrepresented.

This form, or something closely resembling it, has been treated by some of the older authors as a separate species. The name itself has, however, been variously employed. Hübner himself, in his 'Sammlung,' i. pl. 3, figs. 15, 16, appears to illustrate *dictynna* under this title; what Freyer meant when he mentions it incidentally in his account of *asteria* ('Beiträge,' i. p. 116, 1828) it would have been impossible to guess, but in the 'Neüere Beiträge,' iv. p. 49 (1852) he gives it as a synonym of *dictynna*, referring to the above-mentioned figure of Hübner.

ab. *hertha* was originally described by Quensel ('Vetenskaps Acadamie nya Handlingar,' T. xii. p. 280, 1791) as a separate species, though it is really a form of *athalia* quite near to *corythalia* and *pyronia*. There are probably few forms of any of the group about which such a mistaken idea prevails; I have found but one instance—Lampa ('Tidskrift,' 1889, p. 18)—of a description, which has been taken from Quensel's figure, *loc. cit.* pl. x. figs. 9 and 10, and it is certainly a case where it was necessary to consult the figure, for the original concise description is wholly inadequate. It runs as follows: "Alis subdentatis fuscis, suprà anticis fascia maculari, posticis striga punctorum, fulvis." A much longer Latin description follows, calling attention to the many peculiarities not previously noticed. The figure is uncoloured though excellent, and for the colouring of the following description I have used the longer description of Quensel:—

Up. s. f. w.: The outer subterminal line sharply defined and no markings beyond it towards the base, except the large basal suffusion, which melts into the ground colour about one-third of the way across the wing; the ground colour would seem to be somewhat lighter than usual, as in the longer description the word *luteus* is substituted for *fulvus*.

Up. s. h. w.: As in *corythalia*, but with the light spot visible though obsolescent.

Un. s. f. w.: Ground colour dull yellow (*obscure luteus*), the only markings being an indication of the outer subterminal line bordering the brightish yellow (*flavescens*) lunules, the outlines of the lower half of the stigma (or possibly the central part of the basal lines), and between these a series of very narrow longitudinal dashes of unequal length, so narrow as to be mere thin lines, and utterly unlike the black dashes of *eos* and some other forms; none of them extend so far either as the basal markings in the one direction or the outer subterminal in the other.

Un. s. h. w.: Spots of basal band coalescent, of a dull yellow (*luteus*), and rather strongly edged with black; the inner band apparently represented by one dark (or black) spot; the inner part both of the central and outer bands black, the latter failing towards the costa; the outer band fulvous, the terminal and central of a bright yellow (*flavus*).

It will readily be seen that this is a very remarkable form on the under side, even among the *corythalia*-group of aberrations, especially so on account of the fore wing. Aurivillius ('Nordens Fjärilar,' p. 29, 1888), in his description of this form, makes no mention whatever of the un. s. f. w., and my own observation ('Butterflies of Switzerland,' &c., p. 91)—"with long black streaks un. s. f. w., but less black up. s. f. w."—is a very fair sample of the inadequacy of most modern descriptions.

ab. *pyronia*, Hübner, 'Sammlung,' i. pl. 114, figs. 585-588, ♂ and ♀ up. and un. s. (1804), is a modification of the same form, with less of the dark colour on the up. s. f. w., and a

light basal spot in addition to the row of fulvous spots on the up. s. h. w. On the un. s. f. w. are indications of the lines, and a dull darker band across the centre, both the black and the fulvous in the basal half of both wings being more concentrated. On the h. w. the lunular part of the outer band is present, and has a conspicuous black edging on both sides in the male, and on the inner side in the female.

Freyer's *pyronia* ('Neüerer Beiträge,' iv. p. 14, tab. 295, fig. 2 (1842)) has more black on the base of the up. s. f. w., and the black streaks and markings of the following form (*eos*) on the un. s. f. w. are all present, but so obsolescent as to be no longer at all striking.

ab. *eos*, Haworth, 'Lepidoptera Britannica,' i. p. 35 (1803) is illustrated, from the same specimen, in the 'Entomologist,' x. p. 145 (1877); it is also beautifully painted in Stephens's 'Illustrations,' i. pl. iv. figs. 1, 2 (1828): and again (very badly) in Humphreys & Westwood's 'Butterflies,' pl. viii. figs. 13, 14. It is a specimen taken "at Peckham, near London," in June, 1803, which was still, in 1877, in excellent preservation in possession of Mr. S. Stephens, F.L.S. It is very like the female *pyronia* illustrated by Hübner on the upper side, but the inner subterminal line is distinct throughout. On the under side the hind wing is also very near to *pyronia*, except for the terminal and outer bands being more definite, but the fore wing not only has the subterminal lines very distinct though narrow, but has also the spots representing the elbowed line produced into very large, conspicuous, black dashes, taking the place of the dark band in *pyronia*, on which three very small black dashes below the costa are alone visible. Another specimen almost identical was taken in Sussex on June 23rd, 1907, and mentioned and figured by Frohawk, Entom. xl. p. 193.

(To be continued.)

LIST OF PAPERS OF THE LATE MARTIN JACOBY.

By George Jacobson.

(Concluded from p. 16.)

99. Eine interessante Käfergruppe, die Chlamydæ. Ins.-Börse, xviii. 1901, p. 116.

100. Descriptions of Four New Species of Disonycha (Coleoptera Phytophaga, fam. Halticidæ). Entom. xxxiv. 1901, pp. 146–149. [4 new species.]

101. [and *Sharp, D.*, and *Kolbe, H.*] Von Threr K. K. der Prinzessin Therese von Bayern auf einer Rerse in Südamerike gesammelte Insekten. IV. Coleopteren. Berl. Ent. Zeitschr. xlvi. 1901, pp. (463–486), t. vii. [1 new species.]

102. The Name Micropyga. Entom. xxxvi. 1903, p. 189.

103. A further Contribution to our Knowledge of African Phytophagous Coleoptera. I.–II. Trans. Ent. Soc. Lond. 1901, pp. 209–256, pl. x.; 1903, pp. 1–38. [8 new genera, 103 new species, 1 new variety.]

104. Descriptions of New Species of Coleoptera of the Family Halticidæ from South and Central America. Proc. Zool. Soc. London, 1902, pp. 171–204, pl. xx. [1 new genus, 63 new species.]

105. Descriptions of some New Species of Phytophagous Coleoptera from the Island of Mauritius. Entom. xxxv. 1902, pp. 203–205. [6 new species.]

106. Coleoptera Phytophaga Sagridæ. Wytsman, Genera Insect. No. 14, 1903, 11 pp., 1 tab.

Notes and additions, *ibid.* No. 14*bis*, 1904, pp. 13–14.

107. Descriptions of New Genera and Species of Phytophagous Coleoptera obtained by H. Conradt in West Africa (Cameroons). Stettin. Ent. Zeitg. lxiv. 1903, pp. 292–336. [7 new genera, 47 new species.]

108. Descriptions of the New Genera and Species of Phytophagous Coleoptera obtained by Mr. H. L. Andrewes and Mr. T. R. D. Bell at the Nilgiri Hills and Kanara. Ann. Soc. Ent. Belg. xlvii. 1903, pp. 80–128. [9 new genera, 74 new species.]

109. Descriptions of New Species of South American Coleoptera of the Family Chrysomelidæ. Proc. Zool. Soc. London, 1903, ii. pp. 30–59. [57 new species.]

110. Phytophagous Coleoptera obtained by Prof. Sjöstedt in the Cameroons. Arkiv Zool. i. 1903, pp. 223–234, tafl. 10. [1 genus, 9 new species.]

111. Descriptions of some New Species and a New Genus of Chrysomelidæ from South America. Entom. xxxvi. 1903, pp. 169–170, 182–183, 209–211. [1 new genus, 10 new species.]

112. Descriptions of some New Species of Clythridæ (Phytophagous Coleoptera). Entom. xxxvi. 1903, pp. 62–64, 91–93. [1 new genus, 8 new species.]

113. Remarks on a supposed New Genus of Clythridæ (Col., Phytophaga) from Madagascar, described by M. Fairmaire. Ent Monthly Mag. (2), xiv.–xxxix. 1903, p. 111.

114. Descriptions of some New Species of Phytophagous Coleoptera obtained by Baron E. Nordenskiöld in Bolivia and the Argentine Republic. Arkiv Zool. i. 1904, pp. 513–524. [9 new species.]

115. Another Contribution to the Knowledge of African Phytophagous Coleoptera. Proc. Zool. Soc. London, 1904, i. pp. 230–270, pl. xvii. [5 new genera, 63 new species.]

116. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Donacidæ. Wytsman, Genera Ins. No. 21, 1904, 15 pp., 1 pl.

117. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Criocerida. Wytsman, Genera Ins. No. 23, 1904, 40 pp., 5 pl.

118. Description of some New Species of Phytophagous Coleoptera. Entom. xxxvii. 1904, pp. 293–296. [5 new species.]

119. Descriptions of some New Species of Chlamydæ from South America. Entom. xxxvii. 1904, pp. 197–202. [8 new species.]

120. Descriptions of some New Species of Mastostethus (Phyto-

phagous Coleoptera). Entom. xxxvii. 1904, pp. 63–68. [10 new species.]

121. Descriptions of Thirty-two New Species of Halticinæ (Phytophagous Coleoptera) from South and Central America. Proc. Zool. Soc. London, 1904, ii. pp. 396–413. [2 new genera, 32 new species.]

122. Another Contribution to the Knowledge of Indian Phytophagous Coleoptera. Ann. Soc. Ent. Belg. xlviii. 1904, pp. 380–406. [1 new genus, 43 new species.]

123. Männchen oder Weibchen? Ins.-Börse, xxi. 1904, p. 301.

124. Was ist eine Art? Ins.-Börse, xxi. 1904, pp. 155–156; xxii. 1905, pp. 39–40.

125. Sagra Cambieri Duv. = Derchii Gestro. Ann. Soc. Ent. Belg. xlix. 1905, p. 99.

126. Report on the Phytophagous Beetles. Fasc. Malayens. iii. 1905, pp. 137, 139–148.*

Diagnoses of Phytophagous Coleoptera. Descriptions of New Malayan and one Bornean Species of Phytophagous Coleoptera *L. c.*, App. ii. 1905, pp. i–vii. [10 new species.]

127. Resemblance of Chrysomelid with Trigona. Proc. Ent. Soc. London, 1905, p. xviii.

128. Descriptions of New Genera and Species of Phytophagous Coleoptera obtained by Dr. Loria in New Guinea. Ann. Mus. Civ. Genova (3), i.–xli. 1905, pp. 469–514. [7 new genera, 52 new species.]

129. Redescriptions of some New Species of Phytophagous Coleoptera from Madagascar, collected by E. and B. Perrot, in the Collection of R. Oberthür. Ann. Soc. Ent. Belg. xlix. 1905, pp. 186–190.

130. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Megascelidæ. Wytsman, Genera Ins. No. 32, 1905, 6 pp., 1 pl.

131. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Megalopidæ. Wytsman, Genera Ins. No. 33, 1905, 20 pp., 2 pl. [3 new genera.]

132. Descriptions of New Species of Phytophagous Coleoptera of the genera *Homophœta*, *Asphæra*, and *Œdionychis*. Proc. Zool. Soc. London, 1905, ii. (1906), pp. 398–460, pls. xiv–xv. [114 new species.]

133. Descriptions of some New Genera and Species of Phytophagous Coleoptera from New Guinea. Entom. xxxix. 1906, pp. 1–4. [2 new genera, 4 new species.]

134. Description of another New Species of *Æsernia* from New Guinea. Entom. xxxix. 1906, pp. 25–26. [1 new species.]

135. Descriptions of New Genera and Species of African Halticinæ and Galerucinæ. Trans. Ent. Soc. London, 1906, pp. 11–53, pl. iii. [4 new genera, 59 new species.]

136. [and *Clavareau, H.*] Coleoptera Phytophaga. Fam. Chrysomelidæ, subfam. Clytrinæ. Wytsman, Genera Ins. No. 49, 1906, 87 pp., 5 pl.

Addenda et Corrigenda. *Ibid.*, No. 49*bis*, 1907, 1 p.

137. Description of a New Genus and Species of Subfamily

* *Non vidi.*

Clytrini from Australia. Entom. xl. 1907, pp. 148. [1 new genus, 1 new species.]

138. Voyage de M. Maurice de Rothschild en Ethiopie et dans l'Afrique orientale [1904–1906]. Espèces nouvelles de Chrysomelidæ. Ann. Soc. Ent. France, lxxvi. [1907] 1908, pp. 515–525. [17 new species.]

139. Descriptions of Two New Genera and Species of Australian Eumolpini (Coleoptera Phytophaga). Entom. xli. 1908, pp. 26–28. [2 new genera, 2 new species.]

140. The Fauna of British India. Coleoptera II. Chrysomelidæ I. London, 1908, 8vo, xxi. 534 pp., 2 pl. [12 new genera, 355 new species.]

141. Descriptions of New Species of South-American Beetles of the Cryptocephaline Division of the Family Chrysomelidæ. Proc. Zool. Soc. London, 1907 (1908), pp. 829–855. [46 new species.]

St. Petersburgh.

CURRENT NOTES, 1908.

By G. W. Kirkaldy.

1. Rainbow, W. J.: "Notes on Mimicry and Variation," Rec. Austral. Mus. vii. 69–73, frontispiece (September 11th). Lepidoptera.
2. Doncaster, L.: "Animal Parthenogenesis," Sci. Progress, iii. 40–52 (July). Hemiptera; Hymenoptera.
3. Hasemann, L.: "A Monograph of the North American Psychodidæ," Trans. Amer. Ent. Soc. xxxiii. 299–333, and note, pls. v.–viii. (dated September–November, 1907, but not published till at least January, 1908!). Diptera
4. Mitzmain, M. B.: "Insect Transmission of Bubonic Plague: a Study of the San Francisco Epidemic," Ent. News, xix. 353–9 (October). Aphaniptera.
5. Swezey, O. H.: "Observations on the Life-history of *Chætogædia monticola*, Bigot," P. Haw. Ent. Soc. ii. 7–9 (October 15). Diptera.
6. Muir, F.: "On the Stridulating Organ of a Sphingid from Larat," P. Haw. Ent. Soc. ii. 12–3 (October 15th). Lepidoptera.
7. Swezey, O. H.: "On peculiar deviations from Uniformity of Habit among Chalcids and Proctotrupids," P. Haw. Ent. Soc. ii. 18–22 (October 15th). Hymenoptera.
8. Kirkaldy, G. W.: "Some Remarks on the Phylogeny of the Hemiptera-Heteroptera," Canadian Ent. xl. 357–64 (October 2nd).
9. Kolbe, H.: "Mein System der Coleopteren," Zeitschr. Wiss. Insektenbiol. iv. 116–23 (April 30th); 153–62 (June 15th); 219–26 (July 26th). [Not yet finished.]

10. Townsend, C. H. T.: "A Record of Results from Rearings and Dissections of Tachinidæ," Bull. U.S. Ent. (Techn.) 12, pp. 91–118, figs. 25–30 (September 18th). Diptera, &c.
11. Bradley, J. C.: "The Evaniidæ, Ensign-Flies, an Archiac (*sic*!) Family of Hymenoptera," Trans. Amer. Ent. Soc. xxxiv. 101–94, pls. v.–xv. (June, or later).
12. Aldrich, J. M., and Darlington, P. S.: "The Dipterous Family Helomyzidæ," Trans. Amer. Ent. Soc. xxxiv. 67–100, pls. iii.–iv. (March, or later).
13. Dziurzynski, C.: "Die paläarktischen Arten der Gattung *Zygæna*, F. . . ." Berlin. Ent. Zeitschr., 60 pp. and three plates. Lepidoptera.
14. Holmgren, N.: "Über einige myrmecophile Insekten aus Bolivia und Peru," Zool. Anz. xxxiii. 337–49, figs. 1–7 (August 18th). Coleoptera; Hymenoptera.
15. Bocklet, C.: "Ein gynadromorphes Exemplar von *Epinephele tithonus*, L.," Int. Entom. Zeitschr. ii. 123 and 131 (August 8th and 15th). Lepidoptera.
16. Speiser, P.: "Die geographische Verbreitung der Diptera pupipara und ihre Phylogenie," Zeitschr. Wiss. Insektenbiol. iv. 241–6 (August 29th; not finished).
17. Geest, W.: "Untersuchungen über die Wechselbeziehungen zwischen Pigment und Schuppenform und zwischen Zeichnung und anatomischen Verhältnissen des Flügels, dargestellt an der Tagfaltergattung *Colias*, F.," Zeitschr. Wiss. Insektenbiol., iv. 162–9, figs. i.–vi. (June 15th); 208–14, figs. vii.–ix. (July 26th); 251–6, figs. x.–xi. (August 29th). Lepidoptera.
18. Kertész, C.: "Catalogus Dipterorum," vol. iii. pp. 1–366, and a page of addenda, &c. (1908.)

Rainbow (1) figures some Queensland Lepidoptera, and discusses supposed mimicry. Muir (6) describes briefly the stridulatory apparatus of an Austromalayan Sphingid. Dziurzynski (13) discusses the palæarctic Zygænæ and their varieties, &c., at some length. Bocklet records (15) a gynandromorphous specimen of *Epinephele tithonus*. Geest (17) discusses the correlations between pigment and the form of the scales, and between pattern and anatomical relations of the wing, based on *Colias*.

Doncaster (2) briefly summarizes what is known on Animal Parthenogenesis, especially in Aphidæ and Cynipidæ.

Hasemann (3) has monographed the North American Pyschodids, while Aldrich and Darlington (12) have discussed the North American species of Helomyzidæ. Speiser (16) has commenced a paper on the geographical distribution and phylogeny of the pupiparous Diptera.

Bradley (11) has contributed a lengthy paper on the Evaniidæ, illustrated by eleven plates.

Kertész (18) has issued the third volume of his general catalogue of Diptera, dealing with the Stratiomyiidæ, Erinnidæ, Cœnomyiidæ, Tabanidæ, Pantophthalmidæ, and Rhagionidæ, totalling 167 genera and 2874 species.

Mitzmain (4) considers the *rôle* of the flea in the transmission of bubonic plague from rats.

Swezey (5) and Townsend (10) discuss certain points in the biology of Tachinidæ; the former also (7) noting certain deviations from usual habit in parasitic Hymenoptera.

Kirkaldy (8) has outlined a new classification of Heteropterous Hemiptera, based on their supposed phylogeny.

Kolbe (9) has commenced a "new system of Coleoptera."

Holmgren (14) describes several new Coleoptera and Hymenoptera, myrmecophiles from the Neotropical Region.

To prevent future confusion, it may be stated here that the "Circulars" of the Division of Entomology of the Hawaiian Sugar Planters' Experiment Station are not "publications." Up to the end of September, 1908, seven have been printed, but are purely private issues, and are not in circulation.

NOTES AND OBSERVATIONS.

Leucophæa surinamensis (Orthoptera).—Though interesting to the entomologist, the establishment of a new cockroach with us is looked upon in a different light by the gardener. *L. surinamensis* certainly seems to be spreading somewhat rapidly. It is already a nuisance at Kew Gardens. I have just received a specimen for identification from Mr. G. T. Lyle, which was found crawling about on Christmas Day in a hothouse at Bishopstoke, Hants. — W. J. Lucas.

Aberration of Malacosoma neustria.—Referring to the aberration of *Malacosoma neustria* figured in your December number, I have four similar aberrations, all females, bred from ova of a Tiverton (Devon) female in July, 1896. — E. F. Studd; Oxton, Exeter, December 26th, 1908.

Note on Lyctus caualiculatus, F. — I recently had brought under my notice a length of thick lead gas-piping pierced through and through with tiny holes about 1½ mm. in diameter. A piece of Australian "hardwood" along which the pipe had been run was also given me. This showed the presence of small white grubs some 4 mm. to 5 mm. in length. I placed some of the wood in breeding-cages, and in a few weeks there emerged numbers of *Lyctus caualiculatus*, so well known as a destroyer of wicker furniture. The holes in the lead pipe were cleanly drilled as by a sharp awl; their diameter at the top was slightly greater than at the bottom. The gas-pipe was between the roof and ceiling of a building here in Launceston, and the damage was only discovered when workmen were endeavour-

ing to ascertain the cause of the excessive escape of gas in the house. So far as I am aware this is the first occasion on which the larvæ of this beetle have been recorded as destructive to lead in any form.—FRANK M. LITTLER; Launceston, Tasmania, November 25th, 1908.

MECONEMA VARIUM. — With regard to the remarks of Messrs. Swinton and Lucas on the figure in the 'Entomologist' for 1880, p. 252, I think there is no doubt whatever that it is wrongly named. For many years past I have been in the habit, during the late winter months, of gathering a large number of oak-galls (*A. terminalis*, with a few *C. kollari*) for the purpose of breeding any small moths that had passed the winter therein as larvæ or pupæ. Amongst a great number of insects of various orders I have always bred some *M. varium*, a clear, unspotted, green little creature. When I first bred them I was much puzzled to find that they were quite spotless, when, according to the figure (*loc. cit.*), they should have been spotted! *Leptophyes punctatissima* is spotted from babyhood. That Mr. Bignell bred the species figured I have, of course, no doubt whatever, and, as Mr. Lucas tells us that it is generally found on low growth, those Mr. Bignell bred perhaps emerged from fallen galls. I shall have a day's gall-hunting shortly, and will pick up all the fallen ones I can find, and may perhaps breed *L. punctatissima* therefrom, if it occurs in this neighbourhood. With regard to the Lepidoptera bred, I have not been very successful. The following list comprises the lot:—*Cryptoblabes bistriga* (a single specimen), *Hemimene fimbriana* (scarce, about six or seven only), *Pammene argyrana* (a few), *P. gallicolana* (a large number on two occasions, but very few since), *P. splendidulana* (a few each spring), *Carpocapsa juliana* (two only), *Gelechia luculella* (about half a dozen), *Œcophora sulphurella* (not uncommonly), *Bucculatrix ulmella* (three or four), *Lithocolletis* sp.? (a single specimen many years ago), *Nepticula subbimaculella* (three only).—A. THURNALL; Thornton Heath, January 6th, 1909.

CHEIMATOBIA BRUMATA.—This troublesome pest has been gradually increasing in numbers during the past few years. Considerable damage was done by the larvæ to fruit trees in some districts in 1907 and 1908, and I fear 1909 may prove a record in this respect. As with *H. defoliaria*, the emergence was delayed by the mild weather. They began to appear at the beginning of November, increased slowly at first, then very rapidly, reaching their greatest numbers at the end of November and first fortnight of December. During that period the woods after dark presented an extraordinary spectacle. The moths were in countless numbers, and many thousands of pairs could be seen every night. I tried to form some idea of the number of *brumata* per acre during early December; it certainly was not less than fifty thousand, and may well have been double that number. I "grease-banded" most of my standard fruit trees; on each of three large apple trees I counted over a thousand females, notwithstanding that many had been brushed off when renewing the grease. In many cases the number of *brumata* caught in the grease-band was so great that they formed a bridge for others to walk over. They have nearly all disappeared, but a few pairs may still be found every evening. (In

1895 I found pairs on March 1st, but I believe that was following a prolonged frost.) A very unfortunate statement appeared in a scientific agricultural paper about twenty-five years ago to the effect that the females were transported by the males when pairing. This statement has been copied over and over again in various agricultural papers, &c., and has deterred many fruit-growers from banding their trees. It is entirely unfounded, the male *brumata* being quite incapable of flying with the female. Grease-banding, when properly carried out, is an effective remedy, the few ova laid below the bands being insufficient to cause harm. I notice that in this district *brumata* flourishes more on the hills than in the valleys; last year and the year before this was very noticeable.—Edward Goodwin, F.E.S.; Canon Court, Wateringbury, Kent, January 14th, 1909.

On the Effect of Rearing Larvæ of Vanessa urticæ in Darkness.—The above experiment was carried out in the summer of 1908 on larvæ collected in Huntingdonshire. My object was to ascertain the effect, if any, of breeding a large number of these larvæ from the ovum or very early youth to the commencement of the pupal stage entirely, or almost entirely, in total darkness. The temperature of the breeding-cage was frequently taken, and was that of the outside air. The larvæ were abundantly supplied with food, and they fed up in the same time as others kept under ordinary conditions. They were much darker than ordinary, being almost as black as those of *V. io*, with almost total obliteration of the yellow spiracular line: the pupæ were also extremely dark as was anticipated. Fifty-five butterflies emerged, and twenty-one were noteworthy as having an extension of the black spot on the inner margin towards the second costal spot. In a few cases these two spots were joined by a black line, as in var. *polaris*, but more often by black scales between the two; the ground colour of the wings underwent no change. The proportion of butterflies with this black scaling was far higher than in a large number which as larvæ were given as much sunshine as possible, and others which had their food-plants saturated with water many times a day; the proportion among these was not more than five per cent. I have had no leisure to examine each specimen critically, and this note must be looked on as a preliminary announcement only.—(Lieut.-Col. R.A.M.C.) N. Manders; Colombo, Ceylon.

CAPTURES AND FIELD REPORTS.

Stenocephalus agilis and Corixa affinis (atomaria) in Lancashire.—I took a single specimen of the former in Liverpool (July) and of the latter at Birkdale in May last. These are, I believe, the first specimens recorded for this county.—Oscar Whittaker; 13, Lancaster Road, Birkdale, December 22nd, 1908.

Thyphlocyba debilis, Dougl., in Lancashire.—I took a specimen of this rare species on dwarf sallow here in July last year.—Oscar Whittaker.

PYRAMEIS IN JANUARY. — I saw a fresh-looking specimen of *Pyrameis atalanta* flying in the sunshine in a sheltered hollow at Brook, Isle of Wight, on January 7th last.—ORFORD YOUNG, M.D.; Yarmouth, Isle of Wight, January 10th, 1909.

EARLY APPEARANCE OF HYBERNIA RUPICAPRARIA.—On 4th inst. several male specimens of this species were at rest on an electric illuminated window here.—HERBERT W. BAKER; 73, Limetree Place, Stowmarket, Suffolk, January 6th, 1909.

Erratum.—In January number, page 18, line 16 from bottom, for "December 12th" read "December 17th."

TÆNIOCAMPA GOTHICA IN JUNE AND OCTOBER.—I should like to record having taken a somewhat worn specimen of *T. gothica* on the flowers of *Budleia globosa* on June 12th, 1908, and a very perfect specimen at ivy bloom on October 15th. I also captured a good specimen of *Acronycta psi* at sugar on the evening of September 6th. —(Miss) B. CONEY; Pucklechurch, Glos.

PIERIS NAPI, var.—Last May I had a very large number of *brassicæ*, *rapæ*, and *napi*, and among the more or less interesting forms that appeared were a fine male *napi* with the basal portion of all fore wings conspicuously black. Mr. Raynor—who was here yesterday—strongly urged me to send you a note of its occurrence, and thought it deserved a varietal name, so we decided to call it *basi-nigra*. A similar but somewhat more pronounced form of *brassicæ* is figured in Morris's 'British Butterflies,' having been copied from 'The Zoologist,' p. 471. It was taken in a garden in Leicester in 1843. I have always been on the look-out for this form, but though I have bred and captured many thousands of specimens, I never met with anything approaching it previously.—W. H. HARWOOD; 94, Station Road, Colchester, September 4th, 1908.

PTEROPHORUS MONODACTYLUS IN JANUARY.—On Esher Common, January 2nd, I observed *Pterophorus monodactylus*; first, at rest about two feet from the ground on oak palings above dead leaves and behind brambles, and later on, high up on the trunk of a Scotch fir. This capture may serve to confirm the belief that this moth hybernates during the winter months, flying only at times in favourable weather.—D. C. HOLMES; The Briars, Manor Road, Thames Ditton, January 4th, 1909.

[This species most certainly passes the winter in the moth state, but, except perhaps during the coldest weather, it does not seem to become absolutely dormant. It is often seen among the latest insect visitors to ivy bloom and the earliest to the sallow catkins.—ED.]

HYBERNIA LEUCOPHÆARIA ON JANUARY 8TH.—On the oak-fence of Esher Common I took to-day a male *H. leucophæaria*. It was a dark nicely banded specimen, and seems worthy of record, the date being so very early.—D. C. HOLMES.

CAMPODEA STAPHYLINUS (APTERA).—In rotting stumps from which trees have been cut down, I found to-day (January 8th, 1909) several

specimens of this very simple insect, this being, I think, the first time I have noticed it during the winter months. With it was a small centipede of the order Symphyla, and apparently of the genus *Scolopendrella*, which resembles it so closely as to give one the idea that there may be a connection here between the Myriapoda and Insecta—an opinion which has of course been put forward.—W. J. Lucas.

Sphinx convolvuli in Wiltshire, 1908.—I omitted to record during November that I had two very fine specimens of *S. convolvuli* brought me, one taken in Salisbury city, the other in the village of Broadchalke, a few miles out. They are male and female, both perfect. The female was taken in mid-October, the male in early November.—W. A. Bogue; Sunnybrae, Kirtleton Avenue, Weymouth, December 27th, 1908.

Periplaneta australasiæ in Cornwall.—In May, 1906, I took a fine specimen of this cockroach at Truro. I have only recently identified same whilst reading the 'Entomologist,' vol. xxix. p. 124, with an excellent drawing of same on p. 97, both pages indicating the distinct differences between this species and *P. americana*. The note referred to above is by Mr. W. J. Lucas, who indicates that this insect is not a common one; I have therefore thought it might be of interest to send my record.—W. A. Rollason; Lamorna, Truro, Cornwall, January 4th, 1909.

Phigalia pedaria.—Although this species is most often seen during the first three months of the year, chiefly in February, odd specimens have been noted in November and December. This seems to have been the case last year, as Mr. B. Weddell, of Selkirk, informs us that a living male specimen was brought to him on November 2nd. Another example is reported from Haslemere, taken on a street lamp, November 28th; and a male was taken, also on a gas-lamp, at Weymouth, on December 21st.

Hybernia defoliaria.—Having noticed an unusual number of the larvæ of this species last summer, I was not surprised to find the insects plentiful this winter. They commenced to emerge early in October, but, owing to the exceptionally mild weather, they appeared very slowly, and it was not till the end of November that they were well out. From that time until the beginning of January the males were very common, but I came across very few females. The year closed with a few days' frost and snow, quickly followed by a return of mild weather. On January 2nd I found a number of males and females emerging, principally the latter, and I noticed during the evening seventy or eighty pairs. Since then they have depreciated both in number and quality, but even at this date (January 14th) a few are quite fresh. I must have examined some thousands of males, but I found very few exceptional varieties.—Edward Goodwin, F.E.S.; Canon Court, Wateringbury, Kent.

Captures at Light in the Chester District.—The following captures have been effected at the Chester and district electric lamps

since November, 1907:—*Cerura bifida* (4), *Zeuzera æsculi* (1), *Sphinx convolvuli* (2), *Acherontia atropos* (3), *Petasia cassinea* (3), *Tæniocampa gracilis* (1), *Pheosia dictæoides* (1), *Agrotis suffusa* (5), *Dasypolia templi* (1, fourth recorded example since 1907), *Himera pennaria* (5).—Alfred Newstead; Grosvenor Museum, Chester.

Notes from Messina.—I reached here on the 9th November last; temperature 73° in the shade, which later on fell to 67°, at which it now stands. During the last few days rain has fallen heavily, but without lessening the heat. The butterflies on the hills near the town are nearly all such as are found (sometimes only occasionally) in England. The common butterflies here are *Pieris rapæ* (this occurs in centre of town) and *P. brassicæ*; and I captured a fine specimen of *P. daplidice* (November 19th). *Colias edusa* flies about rapidly on the hill-sides; I have only taken males. *Pararge megæra* is common near the torrent-beds. *P. egeria* (one), the local form. *Chrysophanus phlæas*, on the hill-sides. *Pyrameis atalanta*, this is the commonest of the Vanessidæ here, and occurs in gardens, roads, &c. *P. cardui*, a few; but strange to say I have not seen either *urticæ* or *io*. This comprises the list of butterflies I have noticed in mid-November, just a dozen species in all. Moths are scarce; three small species taken. Grasshoppers abound, also a few locusts and beetles. I watched a lizard pounce upon a good-sized grasshopper; it tried to get away into a hole in the wall and slipped down two or three feet, but stuck fast to its prey and then disappeared. Caterpillars are not much in evidence. I noticed some on heath (a species of) on Monte Ciccio, and left them to grow bigger. I think they may belong to a species allied to *Lasiocampa quercus*. During the winter I am not expecting many other species of butterfly to turn up, but shall look forward to the spring.—J. Platt-Barrett.

[The writer of the above, who is probably known, at least by name, to most of our readers, was residing in Messina at the time of the recent earthquake (Dec. 28th). He fortunately escaped, together with his son; but the wife and daughter of the latter were among the victims of that lamentable occurrence.—Ed.]

SOCIETIES.

Entomological Society of London.—At the Annual Meeting of this Society, held at 11, Chandos Street, Cavendish Square, on the evening of Wednesday, January 20th, the following Officers and Council were elected for the Session 1909-10:—President, Dr. F. A. Dixey, M.A., M.D.; Treasurer, Mr. A. H. Jones; Librarian, Mr. G. C. Champion, F.Z.S.; Secretaries, Mr. H. Rowland-Brown, M.A., and Commander J. J. Walker, M.A., R.N.; other members of the Council, Dr. T. A. Chapman, M.D., F.Z.S.; Mr. A. Harrison, F.L.S., F.C.S.; Mr. Selwyn Image, M.A.; Dr. K. Jordan, Ph.D.; Dr. G. B. Longstaff, M.D.; Mr. H. Main, B.Sc.; Mr. G. A. K. Marshall; Professor E. B. Poulton, D.Sc., M.A., F.R.S.; Mr. R. Shelford, M.A.;

Mr. Rowland E. Turner; Mr. J. W. Tutt, and Mr. C. O. Waterhouse. The outgoing President, Mr. C. O. Waterhouse, having alluded to the loss the Society had sustained in the death of seven Fellows, took as the subject of his address, "The Claws of Insects." After briefly describing the various forms of insects' claws which are classified as toothed, appendiculate, bifid, or pectinate; and having given examples of each, he suggested as a subject for investigation, which he hoped entomologists would take up as a study, "Are these forms of claw merely the result of heredity without any special object, or is there evidence to show that the different forms are adapted to different modes of life; in fact, have been developed to meet special needs?" He then proceeded to show, by numerous examples, that closely allied species often had dissimilar claws; that insects with quite different habits had the same form of claw; and that others with different forms of claw seemed to have the same habits. The question therefore appeared to be still an open one, requiring careful investigation, and he appealed for more field observation with a view to solve this and many other problems.—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society.—*Nov. 26th*, 1908.—Mr. A. Sich, F.E.S., President, in the chair: The Annual Exhibition of Varieties.—Mr. Adlard, Bartholomew Close, E.C., was elected a member.—Mr. South exhibited series of *Cirrhœdia vaccinii* and *C. ligula* from the Continent, and discussed at length the various forms and named varieties, comparing them with British examples. He also showed the *Cucullia* species previously shown, stating that upon examination of the genitalia by Mr. Pierce, three of the Continental males were shown to be *C. lychnitis* and two *C. verbasci*, and one bred from a larva found feeding on *Scrophularia nodosa* in North Kent proved to be *C. verbasci* also.—Messrs. Harrison and Main, an extensive bred series of *Aplecta nebulosa*, with a large proportion of var. *robsoni* and var. *thompsoni*, and gave notes and statistics of the results. They also showed a bred gynandrous specimen of *Pieris napi*, left side male, right side female.—Mr. R. Adkin, series of *Boarmia gemmaria* (*rhomboidaria*), comprising typical and black forms reared from wild ova in 1907, and a portion of Edward Newman's series of the same species and of var. *perfumaria*, and discussed the last-named form. He also showed *Anthrocera achilleæ* from Argyllshire, *Nola albulalis* from East Sussex, 1908, a variety of *Chrysophanus phlæas* of a coppery shade with the red band reduced to narrow bars, an example of *Aglais urticæ* with very large blue lunules and tips of fore wings streaked with pale blue-grey, together with a case containing pupa-skins *in situ* of several of the rarer Sesiidæ, resinous nodules with cocoons of *Retinea resinella*, one of which had been appropriated by a larva of *Dioryctria abietella*, cocoons of *Nola centonalis* and of *Hylophila bicolorana*; also *Zenillia roseanæ*, a dipterous parasite on the larvæ of *Tortrix pronubana*, new to Britain.—Mr. G. T. Porritt, varieties of *Abraxas grossulariata* bred from wild larvæ of this year, including an ab. *varleyata* male, in which there was a double row of white rays on the hind wings.—Mr. Newman, a long series of *Grapta c-album* and

var. *hutchinsoni* bred from ova, and read full notes on the life-history. He also showed hand-paintings of the finest varieties bred and captured by him during the season, and an almost perfectly black extreme form of *A. grossulariata*, the under wings alone showing slight traces of white.—Mr. W. Crocker, *Phryxus livornica*, from Torquay, May, 1906, a fawn-coloured *Gnophos obscuraria* from Babbacombe, a very varied series of *Hesperia malvæ* var. *taras*, *Leucania extranea*, taken at sallow in April, 1906, and varieties of *Melitæa athalia* and *M. aurinia*.—Mr. Hy. J. Turner, extremes in size of *Polyommatus damon* from the Alps; a number of species of the genus *Brenthis*, in which the submarginal spots and lunules were more or less coalescent; a nice series of *Satyrus cordula* from Vissoye, with female var. *pœas;* and a box containing numerous species of Rhopalocera from German East Africa and from Biké in Central Africa.—Mr. Lucas, the large earwig *Labidura riparia*, which he had kept alive for some months, feeding it on fish.—Mr. Tonge, *Sirex noctilio*, taken in his house at Reigate.—Mr. Edelsten, a long series of the new British species *Nonagria neurica* from Sussex, with Continental examples; and series from various localities of *N. dissoluta* and var. *arundineta*. —Mr. Joy, an unusually pale example of *Argynnis paphia*.—Mr. Ashdown, a long series of the Longicorn, *Strangalia armata*, to show the range of variation in the markings.—Mr. H. W. Andrews, examples of the British species of Eristalinæ, and read notes on the mimetic resemblances shown.—Mr. Baldock, a number of species of *Ornithoptera*, including the rare *O. miranda* and *O. andromache*.—Mr. Gibbs, a long and very variable series of *Argynnis adippe*, captured in the Vosges Mountains this season, including fine examples of var. *cleodoxa*, and some very brilliant undersides.—Mr. T. W. Hall, a drawer of hybrid Lepidoptera, including *Smerinthus ocellatus* × *populi*, *Notodonta ziczac* × *dromedarius*, *Selenia tetralunaria* × *bilunaria*, and *Ennomos erosaria* × *fuscantaria*. — Dr. Hodgson, a selected series of *Plebeius argus* (*ægon*) from various localities.—Mr. Step, about fifty photographs of fungi found in 1908.—Rev. E. Tarbat, a box containing examples of forty-one species of Lepidoptera taken at Fareham, settling on a white wall in the full glare of a strong electric light, including *Stauropus fagi*, *Epunda nigra*, *Luperina cespitis*, *Nonagria typhæ*, &c. He also showed a *Melitæa aurinia* with unusually small spotting; a *Tæniocampa gothica*, with the "character" reduced to two small spots; and a *Malacosoma neustria* with a very broad, uniformly wide band across the fore wings.—Mr. West (Greenwich), his collection of British Homoptera, including a series of *Idiocerus rutilans*, a species new to Britain, and a specialised series of the innumerable forms of *Philenus spumarius*. —Mr. W. Lucas, a large number of photographs illustrating the life-histories of the denizens of the Scotch fir.—Mr. Pennington, a box of varieties of British Lepidoptera, including var. *fowleri* of *Agriades corydon*.—Mr. Stanley Edwards, several species of exotic *Papilio*, among them being *P. domasepe*, *P. telearchus*, *P. slateri*, *P. cannus*, &c., which mimic different species of Danaine butterflies.—Rev. W. Wheeler, a case containing the species and forms of *Apatura* obtainable from the Alps; a case of the closely allied species and forms of the *athalia* group of the genus *Melitæa*; and a case of the smaller

European species of the genus *Erebia*, including *E. christi*.—Mr. J. P. Barrett a communication from Sicily, noting some twelve species of Rhopalocera which he had met with near Messina in mid-winter, including *C. edusa*, *Pararge megæra*, *P. egeria*, *Heodes phlæas*, *Pieris daplidice*, &c.—Hy. J. Turner, *Hon. Rep. Sec.*

A correction: An obvious mistake was made in the report of October 22nd, when "sallow" was given as the food-plant of *Limenitis sibylla*, instead of "honeysuckle."

City of London Entomological Society.—*November 18th.* — Mr. H. M. Edelsten exhibited *Nonagria neurica* (Hubn.) from Sussex, new to the British list; also *N. dissoluta* and var. *arundineta* from various localities. — Mr. G. H. Heath, *Thyatira batis* with pink coloration in spots replaced by brown, and *Miana strigilis* with red central fascia and white marginal band, both from Ashford, Kent, 1908.—Dr. G. G. C. Hodgson, Zygænidæ from one Surrey locality, mainly *Z. trifolii* and *Z. hippocrepidis*, including several melanic examples of the former, two apparent *trifolii* with a sixth spot, and an apparent *hippocrepidis* with right-hand wings resembling *minos*.—Mr. L. W. Newman, a long series of *Vanessa c-album*, including a few specimens with the c transformed into a d. —Mr. V. E. Shaw, a series of *Lycæna ægon*, Eynsford, July, 1908, including female with coloration approaching to that of the male.—Mr. P. H. Tautz, a bred series of *Amphidasys betularia* and var. *doubledayaria* bred from *doubledayaria* female taken at Wicken.—Mr. L. W. Newman read some interesting notes on observations made while breeding *Vanessa c-album*, and recorded the following as facts observed by him: (*a*) The first ten or fifteen ova laid by female in spring produce var. *hutchinsoni*. (*b*) The remainder of the ova laid by female in spring produce the typical form. (*c*) The *hutchinsoni* imagines emerge first, pair, and lay the ova which produce the autumn brood (*d*) The typical imagines emerge later, refuse to pair, either *inter se* or with *hutchinsoni*, and go into hybernation early in the summer. (*e*) So far as specimens in captivity are concerned, this attempt at hybernation does not succeed, the imagines dying during the winter or early spring.—S. J. Bell, *Hon. Sec.*

RECENT LITERATURE.

The Moths of the British Isles. By R. South, F.E.S., &c. Series II. ("Wayside and Woodland Series"), pp. 376, pl. 159 (96 with 873 figures coloured) and 20 figures in text. London: F. Warne & Co. 7s. 6d. net. 1908.

This volume maintains the excellence we noted in regard to Series I. (Entom. 1908, p. 23), and comes out very promptly after it. It completes the view of the species usually described as "Macros," excepting the Psychids. These are not more entitled to be "Micros" than several families towards the end of the volume.

The outstanding feature, as of the previous volumes, is the repre-

sentation of all the species dealt with by colour photography, chiefly from the actual specimens. The merits of these plates it would be difficult to exaggerate, although two or three seem a little out of focus, and in one the colours have escaped exact superposition.

The Plusias may perhaps be selected for special notice. Whether anyone who had never seen a *Plusia* would realize from the plates that certain portions of the wings shine metallically may be difficult to decide, but those who cannot place themselves in that untutored attitude will see almost the insects themselves, with their silver, bronze, or gold markings. Those from drawings by Mr. Knight, *e. g.* the frontispiece (Pl. 1), leave nothing to be desired; between these, however, and those photographed directly from the insect there is the difference that here every blemish in the specimen is eliminated, whilst in the others every injury and defect is faithfully recorded, as, for example, one sees that the specimen of *P. bractea* was not in so fine condition as some of the others. This, from our point of view, so far from being a blemish, is an unquestionable certificate of truthfulness to nature, since it shows the specimen as it is, and not as we or the artist, possibly erroneously, may think it ought to be.

One might have liked more of the admirable photographs in the text by Mr. Lucas and Mr. Main, altogether twenty or twenty-four, if we include those on the covers, as they illustrate, by what are often beautiful pictures, interesting points, such as natural attitudes, means of concealment, &c.

It would perhaps be unkind to enlarge again on our objections to the unfortunate adoption of English names. Not perhaps always unfortunate, as who can help failing to find some amusement in such names as "The Silver Hook," "The Dark Spinach," "The Slender-striped Rufous," or "The Brussels Lace"?

The plain plates of earlier stages are somewhat unequal, some very good, some less so—all useful to give the beginner some idea of the egg, larva, or pupa of the particular species, or of the group to which it belongs.

Perhaps we ought to note that the latest addition to the British Macros, *Z. achilleæ*, is figured and noticed, as well as the new and interesting dark var. of *E. autumnaria* just discovered by Mr. L. W. Newman; so that the work is quite up to date.

We notice few errata; that in the legend on Pl. 77 is obvious, and will mislead no one. The reference to the early stages of *E. autumnaria* is erroneous both in text and index.

We have looked for as many faults as possible, possibly from envy that such an excellent and complete guide, at so low a price, affords the tyro such help as was not to be obtained in our early days, even from an expensive library—an assistance that will last him until he begins to specialize in some direction or other. Probably it is necessary, now that entomology affords so many wide fields for study, that the early stages should be made so easy, and capable, therefore, of being rapidly mastered.

Such samplings of the text as we have made show Mr. South to have that command of his subject with which we all credit him, and

probably one might read from cover to cover without finding any errors.

There is apparently not to be a further volume of "Micros," and when the young entomologist begins the "Micros" he will presumably want something more advanced than the present work affords. This is perhaps doubtful, but if he asks us where he is to get it, we cannot tell him. There is surely room now for a work on our smaller moths, with illustrations of the imagines similar to those Mr. South gives us, and photographs of their mines, cases, &c., and with distinct, if brief, notes on their life-history—a book useful not only to the tyro but also to the advanced student; if it could cater for both without seriously disappointing either it ought to be successful commercially also.

T. A. C.

The Evaniidæ, Ensign-Flies; an Archaic Family of Hymenoptera. By J. Chester Bradley. ('Transactions' of the American Entomological Society, 1908, pp. 101–194 and pls. v.–xv.)

This is a most valuable contribution to our knowledge of this aberrant and somewhat heterogeneous family of the Parasitica. The author begins with a short consideration of its general features, tabulates the world's genera of the subfamily Aulacinæ, treats briefly of the Fœninæ and at more length of the Evaniinæ, concluding with a catalogue of the world's species of this third division. To British students (if there be such!) the most interesting point is the restoration of the generic term *Fœnus*, adopted by Marshall in his British Catalogue of 1874, but which has ever since given place upon the Continent to the *nomen nudum*, *Gasteruption*, Latreille. Our indigenous species are sadly in need of revision—a very simple matter since but seven were known in 1874, and only one (*Fœnus minutus*, Tourn.) has since been added (*cf.* Entom. xiii. p. 89). Of these, *Trigonalys* is said by Mr. Bradley not to belong to the Evaniidæ at all, and modern Continental authors have extended their *penchant* for "unrecognizable species" (whether the type be extant or not) to *Fœnus jaculator*, Linn. Mr. Bradley's plates are excellent, and are mainly reproduced from photomicrographs.

C. M.

Report of the Entomologic Field Station conducted at Old Forge, N.Y., in the Summer of 1905. By J. G. Needham. Albany, 1908. Pp. 156–263, 29 plates, 29 figures and maps in the text.

In this report we have a most interesting and useful account of work undertaken for the study of aquatic insects in their relation to the food of fishes. Method of work, mayflies, dragonflies, and craneflies are the subjects dealt with. There is in addition a paper by O. S. Thompson on the "Appendages of the Second Abdominal Segment of Male Dragonflies."

W. J. L.

OBITUARY.

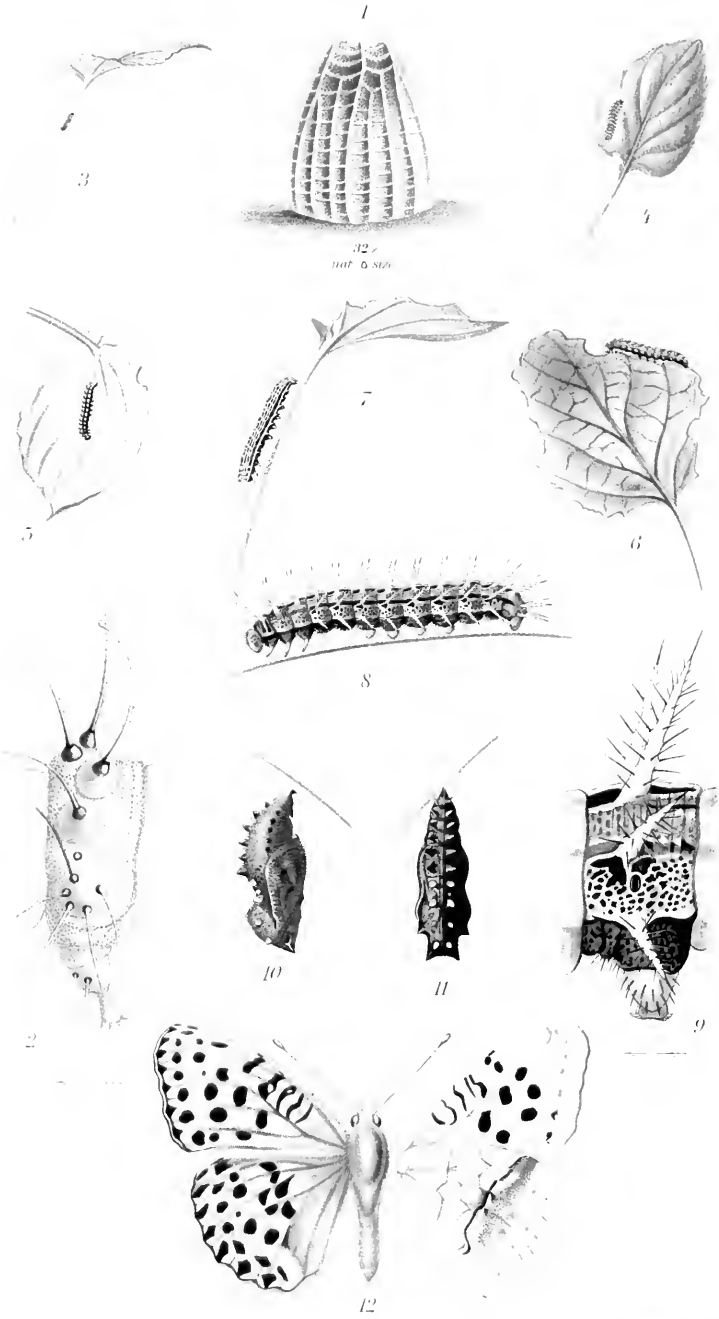
John Adolphus Clark, M.P.S., L.D.S. Eng., F.E.S., &c., died at his residence, Weston Park, Crouch End, N., on the 16th inst., from an attack of angina pectoris. For several years past he had suffered from a slight heart trouble, and this was severely aggravated by a dastardly attack made upon him by a street thief in an attempt to rob him. He was born in Aldermanbury, in the City of London, November 15th, 1842, and in his younger days resided with his parents at Homerton, and here first evinced his taste for entomology at the early age of six years, the neighbouring and extensive Lea Marshes being then a very rich collecting ground for the entomologist. After serving a time as assistant to a medical practitioner (the late Dr. Kibbler), he established himself in the chemist and druggist business in the Broadway, London Fields, which he successfully carried on for many years until he retired to private life, about twelve years since, and took up his residence at Crouch End, where his Friday "At Homes" for some years past have given his numerous friends most enjoyable opportunities of inspecting his magnificent collection of British Lepidoptera and other natural history treasures, and hearing much of interest concerning them from their most genial host. Although possessed of a vast store of knowledge of the earlier stages, habits, and variations of our indigenous Macro- and Micro-Lepidoptera, he seldom published anything relating to them; his "Revision of *Peronea cristana* and its Varieties" (of which he possessed an enormous and unrivalled series), which appeared in the 'Entomologist's Record,' vol. xiii., is perhaps the best known and most important of his contributions to entomological literature. For the several past years he was preparing a similar revision of the named varieties of *Sarrothripa revayana* and *Teras literana*, both of which, unfortunately, remain incomplete. His very extensive collection of British Lepidoptera, equally rich in both macros and micros, and occupying over two hundred drawers, is remarkable for the large number of superb varieties and aberrations, the fine bred series of most of the species, the very perfect state of preservation, and careful and uniform setting. We believe the whole will be shortly offered for sale.

Apart from entomology, he was an enthusiastic collector of birds, and was often out with his gun on the Lea Marshes by 4 a.m. until time to return for business, and his collection, preserved and mounted by himself, includes many rarities and interesting varieties.

He was elected a Fellow of the Entomological Society of London in 1886, and was one of the founders of the old Haggerstone Entomological Society, established in 1858, and now known as the City of London Entomological and Natural History Society, remaining an active member and officer until the last.

He was twice married, his second wife, to whom he was married in 1904, and his three daughters surviving him.

O. E. J.



ARGYNNIS LAODICE

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LIFE-HISTORY OF *ARGYNNIS LAODICE*.

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

(PLATE II.)

ON September 17th, 1907, I received from the Hon. N. Charles Rothschild a number of eggs of *Argynnis laodice*, obtained from four females captured by himself near Cséhtelek, in the Bihar Comitat, Hungary. The four specimens were placed on potted-up plants of dog-violet (*Viola canina*), with the satisfactory result that about one hundred and seventy eggs were deposited on various parts of the leaves and stems. By acquiring this consignment of ova I have been enabled, through Mr. Rothschild's kindness, to have the pleasure of successfully working out the complete life-history of this rare species, which I believe has never been previously accomplished, and, excepting the full-grown larva and pupa that were described and figured twenty-six years ago by G. Künow ('Schriften d. Physik, Oekon Geselbech, zu Königsberg,' vol. xiii. p. 147, 1872), nothing hitherto was known of any of the earlier stages.

Aigner has already recorded ('Rovartani Lapok,' vol. xiv. p. 222, 1907) the capture of the specimens of this *Argynnis* by Mr. Rothschild.

This species, which apparently only occurs in the Réz Mountains and not on the plain, frequents open spaces in the forest in the neighbourhood of streams, where it flies in company with *A. paphia*, *A. adippe*, and *A. lathonia*, frequenting the blossoms of bramble and of hemp-agrimony. All the specimens that Mr. Rothschild secured were worn, being taken from about the middle of August onwards, and were mostly females. Apparently the locality where these were captured is the most western point in Hungary, and possibly in Europe, at which this species has been observed.

The egg resembles that of *Argynnis adippe* in shape and general structure, but in the number of keels it is more similar to *A. aglaia*. It is conical in form but rather straight-sided, and $\frac{1}{32}$ in. in height; the base is twice the width of the crown, which

is sunken, the micropyle finely reticulated. There are about twenty strongly developed longitudinal keels, eight of which run the entire length, starting at the edge of the micropyle, where they rise high above the surface; others start about one-fourth down, and run to the base, which is flattened; the intervening spaces, which are deeply concaved, are transversely ribbed by about fifteen in number; the surface is finely pitted.

Mr. Rothschild informs me, when first laid, the eggs are "a very pale straw-colour, but get gradually darker." This is the case with all the Argynnidæ eggs. When they first reached me some had already assumed two purplish zones, one at the crown, the other near the base; these gradually darken to a deep purplish hue, especially near the crown, the basal one being much paler. The rest of the egg is an olive ochreous colour, excepting the extreme summit, which is transparent; the colouring changes with the maturing of the larva, which is apparently well-developed by the beginning of October, when the above description was made.

During winter the egg appears to deepen somewhat in colour, and assuming a generally rather deeper purplish drab before hatching.

On examining the eggs February 19th, 1908, I found some had just hatched, and others on the point of hatching.

The larva eats its way out by making a large hole in the side of the shell. Directly after emergence it measures $\frac{1}{20}$ in. long. It very closely resembles *A. paphia* in structure. The head is shining olive-black, beset with pale ochreous, finely serrated bristles; on the first segment is a dark dorsal disc, each segment bears a series of large warts, on the summit of each rises a long, finely serrated, club-tipped ochreous brown bristle, with a shining black and brown bulbous base; the dorsal series of bristles are in pairs, both situated on a large wart on each segment; the other two large globular subdorsal warts have each a single hair. There are in all eight hairs and six warts on each segment above the spiracles; below each of the latter is a large globose wart bearing five long, fine serrated hairs projecting laterally; excepting on the last three segments, all the dorsal hairs curve forwards, while those on these last segments are straighter and project backwards; on the ventral surface, claspers, and legs are simple, white, finely-pointed bristles. The entire body (including the legs and claspers) is a pale olive-ochreous colour, densely covered with extremely fine black points, producing a very fine granulated surface. The colouring gradually becomes slightly darker when a day or two old, and the large body-warts assume an olive-green-grey hue.

When touched they fall and roll up, remaining so for many minutes.

The young larva exactly resembles that of *A. paphia* in

structure, having the hairs and warts of similar number and formation.

Owing to dull, sunless weather for about a week from the time of hatching the little larvæ remained inactive, and it was several days before I could detect that they had fed at all, and then they fed only on the cuticle of the more tender parts of the shoots and young leaves of violet (*Viola canina*). They are very sluggish in movement, and only show signs of activity during sunshine.

When a month old, *i. e.* on March 19th, the larva only measured $\frac{1}{9}$ in. long; it is then more uniformly darker in colour, being of a light olive-brown. They now feed along the edges of the young leaves, eating the entire substance.

On April 1st some prepared for first moult, when they measure $\frac{1}{8}$ in. long. The colour is pale ochreous, mottled with purplish brown, chiefly arranged so as to form longitudinal bands, excepting along the dorsal surface, where they are V-shaped on each segment, with a very fine medio-dorsal line running through the V-markings.

First moult took place on April 3rd.

After first moult, sixty-five days old, it measures $\frac{3}{16}$ in. long. There are six longitudinal rows of dusky tubercles with ochreous bases, each bearing several finely serrated bristles, the largest ones having the apex slightly knobbed; each tubercle terminates with the longest bristle. The head is shining black, and beset with bristles; the ground colour is very pale ochreous, streaked and chequered with purplish brown, with a fine medio-dorsal line of the same colour, and a dark dorsal blotch on each side of it, on the anterior part of each segment; a dark spiracular band borders a conspicuous whitish lateral stripe, including the lateral series of tubercles; the under surface, claspers, and legs are also ochreous and chequered with brown.

On April 25th one moulted the second time.

After second moult, eighty-six days old, the larva is $\frac{1}{4}$ in. long. The tubercles are all pale ochreous, and all the dark markings are outlined with whitish; the medio-dorsal line is bordered on either side by a fine white line; the lateral lobes form a whitish band. After feeding they usually crawl down the stems, upon which they rest.

Several moulted third time the middle of May.

After third moult, ninety-four days old, it measures $\frac{1}{2}$ in. long; it is similar to the previous stage, but all the markings are clearly defined. The dorsal tubercles are cream-coloured, those on the first two segments are coppery; the subdorsal and lateral tubercles whitish; legs ochreous; head ochreous, mottled with brown; eye-spots black.

Just before fourth moult it measures $\frac{9}{16}$ in. On May 23rd I noticed two had moulted fourth time.

After fourth moult, one hundred and eleven days old, it is

⅝ in. long. Similar to previous stage, excepting the tubercles, which are of a delicate lilac-pink, bearing black bristles; head and legs ochreous, former speckled with brown, and a central V-shaped mark and black eye-spots. During the greater part of the day they rest at the base of the plant and under the leaves; towards evening they ascend the leaves to feed.

After fifth and last moult, fully grown, it measures about 1½ in. long. The body slightly tapers at each end. There are in all sixty-two rather long tubercles (spines), four on the first segment, two on the second, four on the third and twelfth; on all the remaining segments, fourth to eleventh inclusive, have each six spines; these run in longitudinal rows, being dorsal, subdorsal, and lateral; the first pair on the anterior segment are slightly longer than the rest, and project over the head, but curve gently backwards; the second and third pairs are only slightly curved; all the other spines are straight. All bear numerous black, shining bristles, and each terminates with the same. The outline of all the spines is undulating, the space between each bristle being convex; most of the spines are of a semi-transparent, pearly, milk-white colour, with the bases more or less lilac-pink; those on the first segment are wholly rose-pink, and the succeeding ones gradually become paler, while those on the anal segment are likewise rose-pink; all have dull rose or lilac-pink bases. The general ground colour of the body is olive-brown, being composed of a cream-coloured ground, finely mottled with dull black, forming an irregular chequered pattern; the ventral surface is much darker, mostly of a deep olive-brown; there is a medio-dorsal cream-coloured longitudinal stripe, divided by a fine blackish line; on each segment bordering the stripe is a conspicuous, bold, velvety-black mark, divided in the centre by the dorsal spine; the anterior portion is quadrangular and posterior half triangular; a slightly oblique elongated mark below and behind each dorsal spine excepting the first; along the side is a subdorsal series of dusky markings, bordered on each side by a cream-coloured line forming a wavy band, broken up by the subdorsal spines; below each of these spines, surrounding the spiracles, are bold black mottlings; the subspiracular spines are situated on the dilated lateral undulating ridge, which is dull milky white. The head is flesh-colour, freckled with brown; eye-spots black; a rose-coloured spot on each side of the crown, which is brown in front, with a central λ-shaped whitish mark outlining the head-pieces. The legs are coloured like the head; the claspers are rich red-brown. The anal segment terminates in a conical point of a rust-reddish colour; on the ventral surface of this segment are warty eminences clustered with black bristles, as well as on the anal point; the head and claspers are all bristle-bearing.

Künow's figure of the enlargement of the segment does not

accurately portray the structure or markings of this larva; he represents the spines as straight-edged, and the bristles much too small, and the colouring of the spines of the sixth segment, which he figures as being wholly pink, are in all the larvæ in my possession as I have described. He neither shows the second dorsal slightly oblique mark, nor the subdorsal markings forming a band. In his figure of the larva there is wanting much detail of markings; the first and last spines are much too short, and represented as being quite straight, which should be longest and curved on the anterior segment, and they are all too dull in colour.

On June 22nd the first larva attached itself by its hind claspers to a pad of silk spun on the gauze cover, and pupated on the 24th. Just after pupation it is mostly of a brownish-pink colour, which gradually deepens into a shining bronze-black, with a few ochreous-brown speckles appearing on the abdomen. The metallic spots of the mature pupa are at first exactly similar to mother-of-pearl.

The pupa averages in length $\frac{13}{16}$ in.; it so closely resembles *A. paphia* in structure and markings that they are almost indistinguishable, and as regards colouring *A. laodice* and the dark forms of *A. paphia* are exactly alike. The only slight difference between the two species is that in *paphia* the subdorsal angular projections on the third abdominal segment are rather larger than those of *laodice*, and when viewed dorsally *paphia* is rather wider across the base of the wings.

A. laodice pupa, dorsal view: Head with two pointed lateral horns, a similar but smaller angular point at base of wings; continued along the base is a convex ridge, then concave across the middle, and bulging at hind margin; abdomen attenuated to anal extremity. Side view: Head beaked, thorax keeled and angular, sunken at base of abdomen and metathorax; abdomen curving to anal segment, which terminates in a truncated projection bearing the cremastral hooks; ventral surface of abdomen contracted; wings bulging near apex; antennæ serrated; leg-joints prominent.

Colouring: Ground colour pale buff-brown, inclining to pinkish over the head and thorax; there are two subdorsal rows of sharply pointed conical projections commencing on the prothorax; the first five pairs are of a beautiful metallic silver-gilt; these are placed on the three thoracic segments and the first two abdominal segments; the remaining pairs are without metallic lustre, being shining variegated brown; those on the third segment are largest, and those on the ninth are very minute; on the fifth, sixth, and seventh segments are very small medio-dorsal points. The whole surface is very finely reticulated with dark brown, forming a delicate fibrous pattern; across the wing are two wavy brown bands, exactly similar to *paphia*; the dark spiracles are

placed on a dusky stripe, and the ventral abdominal surface is indistinctly striped.

Künow says a striking point about this pupa is the extreme prominence of the feet and feelers. I do not, however, find any striking difference from that of *A. paphia* in either the legs or antennæ.

Explanation of Plate:—Fig. 1. Egg, drawn 4/10/1907. Fig. 2. Seventh segment of larva directly after emergence, drawn 20/2/1908. Fig. 3. Larva, first-stage, 27 days old, drawn 18/3/1908. Fig. 4. Larva, 21 days after 1st moult, 65 days old, drawn 24/4/1908. Fig. 5. Larva, after 2nd moult, 86 days old, drawn 15/5/1908. Fig. 6. Larva, after 3rd moult, 94 days old, drawn 23/5/1908. Fig. 7. Larva, after 4th moult, 111 days old, drawn 9/6/1908. Fig. 8. Larva, after 5th moult, fully grown, 124 days old, drawn 22/6/1908. Fig. 9. Larva, after 5th moult, fully-grown, seventh segment, drawn 23/6/1908. Fig. 10. Pupa, five days old, light-form, drawn 29/6/1908. Fig. 11. Pupa, eight days old, dark form, drawn 9/7/1908. Fig. 12. Imago, ♂, upper and under side.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By George Wheeler, M.A., F.E.S.

(Continued from p. 32.)

The next two forms do not so clearly belong to this group, but still they are remarkable for presenting a greater display of the fulvous ground colour, the one on the fore, the other on the hind wing, though in the former case the hind wing seems to belong rather to the other or *navarina*-group, as, indeed, is the case with *hertha*, and even with *corythalia* itself. The first of the two is:—

ab. *hisopa*, Sélys-Longchamps, "Énumération des Insectes Lépidoptères de la Belgique," p. 19 (published in the 'Mémoires de la Société Scientifique de Liège, 1845). It is described as follows:—"Dessus* des ailes brun. Les supérieures avec trois bandes de taches fauves très larges, les inférieures avec une bande seule analogue antéterminale. Dessous des inférieures avec quatre taches arrondies noires à la base qui est fauve. Cette couleur terminée par du noir. Le reste d'un jaune clair, avec les nervures et une raie antéterminale noires et une série transverse de cinq taches fauves non cerclées de noir."

This series of five transverse fulvous spots evidently represents the outer band. I know no illustration of this aberration, but the description is sufficiently clear.

The name is spelt *nisopa* in the 'Annales de la Société Entomologique Belge,' i. p. 19 (1857), in the list of Belgian forms of Lepidoptera.

* Up. s. brown. F. w. with three very broad bands of fulvous spots, h. w. with only one corresponding antemarginal band. Un. s. h. w. with four rounded black spots at the base, which is fulvous edged with black. The rest of the wing is light yellow, with the nervures and one antemarginal line black, and a transverse series of five fulvous spots, without any black edging.

The second of these forms is the—

var. *helvetica*, Rühl, 'Societas Entomologica,' iii. p. 137 (1888), which he also describes in his 'Paläarktische Gross-Schmetterlinge,' p. 405 (1892–1895). In the former work there is a long Latin description which my respect for the author compels me to refrain from giving in the original, so startling is its construction, and which I will therefore, contrary to my usual practice, translate as follows :—"Wings scarcely rounded, fulvous above, partially reticulated with fuscous, the hind wings with the central band enlarged, in distinct streaks, and forming five definitely separate streaks, of which the second and third are longer than the first, fourth, and fifth. The hind wings beneath yellowish, with the middle band silvery white. This form is so far remarkable for a very noticeable mark in the second basal cell of the hind wings beneath, a yellow oblong spot bordered with black, alike in both wings."

This form is remarkable for three things: the complete absence of the extra line, up. s. h. w., in combination with a very restricted basal suffusion, leaving a broad central band of the ground colour, such as is usual in *parthenie*; the silvery white central band, un. s. h. w., in the male as well as the female; and the size, shape, and colour of the second spot of the basal band. It appears to be a local form found at Bergün and Stalla, in the Grisons, in July. The upper side gives a remarkable facies, which I have several times noticed in Rhone Valley specimens, but without the peculiarities of the under side, though I have also taken at Frenières, above Bex, a very fresh male with quite white terminal, central, and basal bands, the light spot also being white; this specimen, however, has a normal upper side.

To this group of aberrant forms also belong three others, *viz.* :—

ab. *samonica*, Riesen, 'Stettin Entomologische Zeitung,' 1891, p. 357, which is described as having the upper side of *corythalia*, but the under side normal.

ab. *virgata*, Tutt, 'British Butterflies,' p. 305 (1896), which "has the spots forming the central band of the fore and hind wings lengthened, and these make a distinctly marked central band."

ab. *obsoleta*, Tutt, *l. c.*, is thus noted: "Occasionally there is a failure, or partial failure, of the dark transverse lines, the wings becoming largely fulvous."

We must also add the local Spanish form :—

ab. *iberica*, Staudinger, 'Catalogue,' 3rd ed. p. 32 (1901), which is thus shortly described: "Plerumque major, dilutior, minus nigro picta."

Coming now to the second group of aberrations in which the fuscous predominates, the oldest named form which belongs with certainty to this species (*athalia*) seems to be :—

ab. *navarina*, Sélys-Longchamps, 'Enumération des Insectes Lépidoptères de la Belgique' (*v. supra*), p. 19, 1845. His description reads as follows* :—"Toute brune en dessus avec une série antéterminale de taches fauves. Le dessous des ailes plus noir qu'à l'ordinaire." He states that he is describing the insect figured by Ernst & Engramelle, 'Papillons de l'Europe,' vol. ii. pl. lxii. suppl. viii. figs. 31 *e*, *f* (1780), and referred by them, p. 252, to Esper, 'Schmetterlinge Europas,' i. p. 382, which is his description of *dictynna* illustrated on pl. xlviii. (suppl. xxiv.). Sélys-Longchamps consequently remarks that the absence of the black spots in the outer band un. s. h. w. at once removes it from *dictynna*, and, indeed, Ernst & Engramelle refer their figures back to their first volume, pl. xix. fig. 31, and the corresponding letterpress, pp. 67, 68 (1779), where a further reference is made to the previous plate of Esper (i. pl. xlvii. suppl. xxiii.), which represents *athalia*. The following description is made from the figure to which Sélys-Longchamps refers :—

Up. s. f. w. : Ground colour only shows between the subterminal lines and in a single spot outside, and two inside the stigma; on h. w. only between the outer and inner lines, and in the light spot.

Un. s. f. w. : Lunules yellow, with a few yellow spots below the costa and about half-way down the wing inside the outer subterminal; beyond this the whole wing is fulvous, with a series of six long, rather wedge-shaped, black dashes starting from the inner subterminal, a square black spot taking the place of the stigma, and an oblong black spot in the middle of the base representing the basal dash.

Un. s. h. w. : Terminal band shows dull grey spots near the arch of the lunules except at anal angle; inner part of the outer and central bands black; outer part of central band pale yellow: rest of wing fulvous, except the light spot and the first, third, and fourth spots of the basal band, which are of the same shade as the spots in the terminal lunules. (This colour may have changed in the plate.)

A variant of this aberration is figured, without name, by Hübner, 'Beiträge,' ii. pl. iv. fig. *W.* 1, 2, the under side of which has the outer part of the fore wing very pale, the spots forming the elbowed line prolonged into dashes, the stigma and the space between the basal lines being filled in with black, and the basal dash being represented by a triangular black spot. The hind wing appears to have the usual bands, but the outer has the dark lunules very slightly represented, and failing altogether towards the costa, the space between them and the central band being filled in with black in the lower half of the wing; most of the base is also black.

A Dutch specimen referable to this form is also illustrated

* "Entirely brown above, with an antemarginal series of orange-brown spots. The under side with more black than usual."

for a paper by Capper in the 'Tijdschrift voor Entomologie,' vol. xlii. pl. ii. fig. 3, the upper side of which is definitely *navarina*, but the under side is nearly normal, except that the elbowed line is again represented by a series of black dashes. Fig. 4 on the same plate represents a transitional female, showing on the upper side two rows of fulvous spots on the fore wing, and part of a third row on the hind wing. The under side is like that of the male, except that the black dashes representing the elbowed line are shorter.

ab. *aphœa*, Hübner, 'Sammlung,' vol. i. pl. 147, figs. 738, 739, probably represents an aberrant form of this species, but in the absence of date and locality it is impossible to speak with confidence. Most authors have, however, accepted it as such without question. The following is a description :—

Un. s. f. w.: Outer subterminal coalescing with border; inner subterminal very fine; elbowed line very broad, almost reaching the inner subterminal; the basal suffusion forms two large black spots, one above the median nervure reaching to the inner basal line, and another below it joining the marginal blotch; beyond the outer basal line is a black blotch followed by yet another surrounded by a thin line of the ground colour, which expands into a bar towards the inner margin.

Up. s. h. w.: Has a broad black border, followed by a narrow lunular line of the ground colour, edged with an equally narrow lunular line of black representing the outer line; the basal suffusion extends to the inner line, but shows just within the latter a row and part of a second row of very small spots of the ground colour; the light basal spot is prolonged into a scimitar-shaped curve up to the costa.

Un. s. f. w.: Has black lunules almost filling the usual terminal lunules, whose arrangement rather suggests *parthenie*. This peculiarity is exaggerated on the hind wing. The elbowed line is represented by large elongated spots, and the basal band of the hind wing is completely invaded by the dark inner band; otherwise the under side is fairly normal.

This must not be confounded with Freyer's *aphœa*, 'Neüere Beiträge,' vii. p. 169, pl. 696, fig. 1 (1858), which appears to be a form of *parthenie* which one meets with occasionally in the Rhone Valley, and doubtless elsewhere. Its sole distinction, which, however, produces a very remarkable facies, is the great breadth of the elbowed line, and the unusual size of the marginal blotch on the upper side.

This form brings us by a natural sequence, though somewhat out of chronological order, to the corresponding form of *athalia*, var. *mehadiensis*, Gerhardt, 'Berliner Entomologischer Zeitschrift,' vol. xxvi. p. 126 (1882). It is described as follows* :—

* A very beautiful aberration of *athalia*, striking in consequence of its pronounced markings; from Viertlau, Mehadia (Hungary); rather larger than ordinary *athalia*; the black band crossing the middle of the fore wing

"Eine sehr schöne, durch deutlich ausgesprächte Zeichnung auffallende Abart von *Athalia*: von Viertlau, Mehadia: etwas grösser als die gewöhnliche *Athalia*; die in der Mitte der Oberflügel über den ganzen Flügel sich ziehende schwarze Binde ist breiter als bei der Stammart, und endet am Innenrand in einen länglich viereckigen Fleck, der bei der Stammart gewöhnlich nur durchbrochen erscheint. Auch auf der Unterseite ist die Binde weit deutlicher markirt als bei der gewöhnlichen *Athalia*."

Here again the breadth of the elbowed line and the large oblong marginal blotch are the special characteristics. It appears to be rather a variety than an aberration, and so far as the upper side is concerned it is, apart from size, the usual form at Faido, in the Leventina, and indeed, in a more or less modified condition, the only form I have seen from that locality.

(To be continued.)

ORIENTAL CAPSIDÆ.

By W. L. Distant.

Mr. R. I. Pocock, who is working out the mimetic relationship between various insects and spiders included in a collection from the Nilgiri Hills, has asked me to identify the following Rhynchota, in order that he may be able to refer to them in his paper shortly to be published in the 'Transactions' of the Linnean Society of London. All the species belong to the Capsidæ, are apparently undescribed, and will be figured in the Appendix to my Rhynchotal portion of the Faun. Brit. India.

Rhodoclia, gen. nov.

Head broad and convex, a little more anteriorly produced in male than in female, the postocular longer than the anteocular area, strongly constricted at base, slightly longitudinally incised on centre of disk, the apex subangularly produced in front of the insertion of the antennæ, eyes of moderate size and rounded; antennæ long, longer than the body, first joint longer than either the second or third which are subequal in length, fourth longest, moderately thickened and a little curved; rostrum passing the intermediate coxæ, first joint thickened and about reaching eyes, second longest; pronotum short, armed with a long horizontal or slightly backwardly directed slender spine on each side; hemelytra more or less rudimentary, more developed in the male than in the female; abdomen

is broader than in the type, and ends on the inner margin in a longish four-cornered spot, which in the type generally appears broken up. On the under side also the band is far more strongly marked than in ordinary *athalia*.

short and broad, pedunculate at base; legs long and slender, basal and apical joints of tarsi about equally long, tibiæ distinctly longer than the femora.

This genus may be placed in the Division Myrmecophyaria, Reut.

Rhodoclia convictionis, sp. n.

Head, pronotum, scutellum, and hemelytra piceous-brown; head with a pale ochraceous line extending centrally and perpendicularly for a short distance from base, and then curved and diverging on each side to the anterior margins of eyes; scutellum with a central pale longitudinal line; abdomen greyish ochraceous; head beneath, sternum, rostrum, and legs pale brownish ochraceous; the pedunculate base of abdomen centrally piceous, with the lateral margins greyish; legs and antennæ thinly spinously hirsute, the head also margined with pale long hairs. Long. ♂ 6 to 8, ♀ 5½ to 6 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

ZARATUS, gen. nov.

Head subtriangular, obliquely deflected in front of eyes, moderately centrally longitudinally sulcate on disk, eyes of moderate size but a little projecting beyond the anterior margin of the pronotum; antennæ with the first joint nearly as long as head, second joint more than twice as long as first, third longer than first, fourth mutilated; rostrum not reaching the anterior coxæ, first joint about reaching base of head; pronotum elongate, but a little broader at base than long, transversely constricted a little before anterior margin, posteriorly convexly tumid, anterior and posterior margins truncate, the lateral margins narrowing to apex, angularly sinuate at the transverse constriction, thence straight to anterior margin; scutellum small, subtriangular; clavus long, almost reaching to base of cuneus; corium with the lateral margins strongly concavely sinuate, broadly widened at the cuneal area; membrane slightly passing the abdominal apex; abdomen broad, globose, constricted at base; legs of moderate length, the posterior tarsi mutilated.

Allied to the Neotropical genus *Zosippus*, Dist., from which it principally differs by the unarmed scutellum.

Zaratus repandus, sp. n.

Head, pronotum, and scutellum pale cinnamon-brown; scutellum with an obscure pale concave line and a small basal spot; corium pale cinnamon-brown, an oblique basal spot on each side, which are almost connected with a transverse spot beyond apex of scutellum, and a transverse concave fascia on each side before cuneus whitish, the cuneal suture more obscurely whitish; membrane black, with an obscure pale transverse fascia near base; legs pale cinnamon-brown, apices of femora and about apical thirds of tibiæ and the tarsi pale stramineous, apices of tarsi black (posterior tarsi mutilated); antennæ pale ochraceous, third joint, excluding base, black; body beneath imperfectly seen in carded specimens. Long. 4 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

Armachanus nilgiriensis, sp. n.

Pale brownish ochraceous, a transverse linear white fascia crossing clavus near apex of scutellum, and an oblique similar fascia near middle of corium; before the latter the lateral area is also more or less greyish white; cuneus with a prominent black basal spot; membrane very pale fuliginous; body beneath and legs unicolorous. Somewhat closely allied to *A. monoceros*, Dist., but a more slender and attenuated species, the posterior pronotal area shorter, the anterior area longer, narrower, and moderately narrowed at base, thus bringing the two areas or lobes into more divisional character and into greater contrast; the head is more elongate, and has a median longitudinal darker line; the scutellum, clavus, and central area of corium are not darker in hue as in *A. monoceros*, but concolorous with the general pale brownish ochraceous coloration. Long. 6 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

Nicostratus princeps, sp. n.

Brownish ochraceous; a transverse white fascia crossing corium and clavus at apex of scutellum; membrane piceous; head very large and globose, almost circular, about as long as broad, with a transverse rounded incised line between the eyes; antennæ pale ochraceous, apices of second and third joints, and the apical joint excluding base, black, second joint subequal in length to that of third and fourth together; pronotum strongly transversely constricted before middle, the anterior area or lobe narrow and armed with two strong diverging spines, the posterior area or lobe globosely tumid, deflected anteriorly, the lateral angles subprominent, the posterior margin very slightly concavely sinuate; scutellum developed into a strong upright semi-acute spine; corium with the lateral margins concavely sinuate, widened and tumid at apices; membrane considerably passing the abdominal apex; legs almost uniformly brownish ochraceous. Length, 5 millim.

Hab. Nilgiri Hills; Barwood Estate (H. Leslie Andrews).

Strongly differing from *N. balteatus*, Dist., by the much larger and more strongly developed head, different colour, more acute spine to scutellum, &c.

COMACLA SENEX, Hb., ab. *FUMOSA*, n. ab.

By Eustace R. Bankes, M.A., F.E.S.

Fore wings smoky brown. Hind wings rather paler. The usual blackish markings are present on all the wings, but are rendered very inconspicuous by the darkness of the ground-colour. Head, thorax, abdomen, &c., proportionately dark as compared with the type.

This aberration, which I have not seen from elsewhere, and of which I have failed to find any published figure or description,

occurred to me very sparingly, in 1906–7, in the Isle of Purbeck, Dorset, in company with numerous examples of the better-known forms, and my captures included individuals of every shade between the darkest representatives of ab. *fumosa* and the typical form. The fact that I have not taken any females referable to ab. *fumosa* affords no good reason for supposing that this dusky aberration is confined to the opposite sex, for the total number of females that has rewarded my efforts is very limited.

Norden, Corfe Castle: Nov. 10th, 1903.

NOTES ON BRACONIDÆ.—VIII.: ON A PART OF MARSHALL'S COLLECTION.

By Claude Morley, F.E.S., &c.

While looking through the earlier part of the Rev. T. A. Marshall's collection of Braconidæ, which has now passed from the late Dr. P. B. Mason to a resting place in the British Museum, in January, I jotted down a few notes, which will add several species to the British list, and others of general interest.

I should, first, like to say that my record of *Bracon flavator*, Fab., as an indigenous species (E. M. M. 1908, p. 269) is quite wrong; the insect is in reality *Doryctes leucogaster*, Nees, a common kind along all the coasts of the Mediterranean, and known to extend as far north as Central Europe, though no mention of it as British exists. It has been several times bred from the Longicorn beetles *Rhagium indagator* and *Hylotrypes bajulus*. There is, however, certainly a female of *B. flavator*, Fab., in the Stephensian collection, under the name *B. denigrator*, applied by Curtis (B. E. pl. lxix.) to *Proterops nigripennis*, Wesm. This may, of course, be British, though none have since been discovered. I found a single female of *Bracon impostor*, Scop., under the same name in Stephens's collection. This is a somewhat frequent species in Central and Southern Europe, preying upon *Monochammus sutor*, a Longicorn occasionally introduced into the British docks, though doubtfully indigenous, and its parasite may have been similarly imported. *Bracon initiator* of Stephens's collection (et Wesm. nec Fab.) = *Cœliodes scolyticida*, Wesm., male and female. *Bracon instabilis*, Marsh. (André, xv. 1897, 70) from Cornwall (type in Brit. Mus., with a second, both labelled "Botusfleming"), and *B. virgatus*, Marsh. (*lib. cit.* 68) from Cornwall (type in Brit. Mus., labelled "Botusfleming," with a second from Cameron's collection, labelled "Marsh Mills, June 30th"), are new to Britain. *B. roberti*,

which I erroneously stated (E. M. M. 1908, p. 269) to have been hitherto not bred, is said (André, xv. 1897, 80) to have been raised by Bignell, in Devon, from *Coccyx strobilella*, Linn. There are specimens of *Bracon abscissor*, first noted as indigenous by me (E. M. M. 1906, p. 109), from Swanage, Nunton in Wilts, Cornworthy, Botusfleming, and Niton, in Isle of Wight; it is probably not rare. Of *B. piger*, Wesm., previously only noted from Belgium, there are examples from both Cornworthy, in Devonshire, and Nantes, in France. *B. intercessor* is not recorded as British; there is a male bred "by W. H. B. Fletcher from *Gelechia obsoletella*; Bridgman has three more," presumably contained in his collection, now in the Castle Museum at Norwich. A female *Bracon scutellaris*, Wesm., also new to Britain, is labelled "Plumstead, 1st June, 1893." *B. subcylindricus*, Wesm., is represented as indigenous by a single female, captured by Marshall in the "Isle of Wight." I have just examined a female *B. fulvipes*, Nees, bred by H. M. Edelsten on July 15th, 1908, from *Cœnobia rufa*.

Exothecus incertus, Wesm., must be added to our fauna on the strength of a single male in Marshall's collection, captured by him at Botusfleming, in Cornwall. In like manner we must include *Clinocentrus stigmaticus*, Marsh., next to our *C. vestigator*, on the strength of an example (not in the collection), recorded by him (André, xv. 131). *Allodorus semirugosus*, Nees, has not been found with us before. There are three examples in the collection, two labelled "Aviemore, 23, 76," by Champion, and one from "Rannoch," in Marshall's handwriting; it is one of the *Sigalphides*. It is very remarkable how few of each species Marshall possessed in the Areolarii; nearly all are represented by one, two, or three specimens only. The most populous is *Apanteles fulvipes*, Hal., of which there are eighteen. Nearly all the bred examples are from Bignell's collection, and one can but wonder that, with such a paucity of material, Marshall arrived at so full a knowledge of the group; how full it is can only be shown by subsequent work upon it, though personally I have found but few specimens which could not be assigned to one or other of his excellent descriptions. Of *Agathis* there are but two males of *A. brevisetis*, Nees, and a single female of his *A. angelicæ* from Britain; though *A. malvacearum* is represented from Corsica, *A. nigra* from Nantua, in the Jura Mountains, and *A. tibialis*, ex coll. Konow, from Mecklenberg. Marshall had already taken *Apanteles tenebrosus*, brought forward by me from Britain (Entom. May, 1906), at Nunton, in Wilts. *Microdus pumilus*, Ratz., also new to our fauna, is represented by a female found by him at Cornworthy, near Totnes.

MEMBERS OF THE ENTOMOLOGICAL CLUB FROM ITS ESTABLISHMENT IN 1826 TO THE PRESENT TIME.

1826.

Club instituted by Mr. George Samouelle in conjunction with Messrs. *A. H. Davis, *S. Hanson, and E. Newman.

1832.

†Rev. C. S. Bird, Messrs. *W. Bennett, J. S. Bowerbank, †W. Christy, Jun., †J. Curtis, A. H. Davis, E. Doubleday, S. Hanson, *J. Hoyer, E. Newman, F. Walker, and *J. J. Walton.

1836.

In this year a Constitution and Bye Laws were drawn up and printed. The eight members being—Messrs. W. Bennett, *J. B. Bevington, J. S. Bowerbank, *J. F. Christy, A. H. Davis, J. Hoyer, E. Newman, and F. Walker.

1841–1864.

Mr. W. Bennett (removed into country, 1851).
Dr. J. S. Bowerbank (died March 8th, 1877).
Mr. J. F. Christy (died April, 1851).
Mr. E. Doubleday (died December, 1849).
Mr. J. Hoyer (died 1848).
*Mr. T. Marshall (resigned 1848).
Mr. E. Newman (died June 12th, 1876).
Mr. J. Walton (removed into the country, 1852).
Mr. S. Stevens (elected November, 1852; died 1899).
Mr. David W. Mitchell (elected 1849).
Mr. W. Spence (elected 1850; resigned 1858).
*Mr. Mathew Marshall (elected 1850; resigned 1859).
*Mr. Alfred White (elected 1851; resigned 1852).
Mr. J. F. Stephens (elected Nov., 1852; died Dec., 1852).
Dr. Power (elected 1857; resigned 1882).
Mr. F. Grut (elected 1857; died 1891).
Mr. Horace Francis (elected 1859; resigned 1861).
Mr. G. R. Waterhouse (elected 1859; resigned 1864).
*Mr. Henry Adams (elected 1861; resigned 1876).
Mr. Philip Harper (elected 1864; resigned 1866).
Mr. Edward Sheppard (elected 1864; died 1883).

1865.

On January 18th of this year the membership was increased to nine instead of eight.

Rev. Hamlet Clark (elected 1865; died 1867).
Mr. Joseph S. Baly (elected 1866; resigned 1869).
Mr. Osbert Salvin (elected 1867; resigned 1869).
Dr. Battershall Gill (elected 1870; resigned 1873).
Dr. B. T. Lowne (elected 1873; appointed curator 1876).
*Mr. Charles Dupré (elected 1873).

† Honorary Member (?)

*Dr. Edward Hart Vinen (elected 1876).
*Mr. Henry Virtue Tibbs (elected 1876).
Mr. Peter Hinckes Bird (elected 1880).
Rev. George Henslow (elected 1881).
Dr. William Francis (elected 1881; died 1904).
Dr. Christopher Dresser (elected 1883).
*Dr. Thudichum (elected 1884).
Mr. G. H. Verrall (elected 1887).
Dr. Philip Brooke Mason (elected 1891; died 1903).
Mr. Robert Adkin (elected October, 1892).

1898.

A new Code of Laws adopted. Membership reduced to eight.
Mr. G. T. Porritt (elected January, 1898).
Mr. T. W. Hall (elected January, 1898).
Mr. Horace St. John Donisthorpe (elected November, 1900).
Mr. Arthur Chitty (elected March, 1904: died 1908).
Prof. E. B. Poulton (elected March, 1904).
Mr. H. Rowland-Brown (elected May, 1908).

The names of the present members of the Club are printed in italics. It is hoped that some of our readers may be able to furnish short biographical notes of those members indicated in the above list by an asterisk.

An historical sketch of the Entomological Club is published in the 'Entomologist' for 1892, pp. 4–9, and there is further reference to it in the 1899 volume of the same Journal, pp. 160–164 and 224–226. The Laws of the Club are printed in the 'Entomologist' for 1898, pp. 41–42.

RICHARD SOUTH, *Hon. Sec.*

NOTES AND OBSERVATIONS.

THE AB. PORRITTII OF CIDARIA SUFFUMATA. — For the sake of clearness in the future it seems advisable to state that the figure of *Cidaria suffumata* given as ab. *porrittii* in Mr. South's most excellent second volume of the 'Moths of the British Isles' just published (plate 72, fig. 2) does not represent the form as originally named by Robson. The figure has evidently been taken from a specimen of the well-known so-called "Dover form," whereas the ab. *porrittii* is really a black and white moth, the white by daylight being a little "creamy." The basal mark and central band are black, the rest of the wings white, with the exception of the short line near the apex of the fore wings, the minute marginal dots, and the faint darker clouding at the base of the hind wings. The form is well figured in the 'Entomologist' of May, 1878, and in Barrett's 'Lepidoptera of the British Islands,' vol. viii. pl. 359, figs. 1*d* and 1*h*. The "Dover form" has the pale parts of the wings marked with brown. It also always occurs in South-west Yorkshire along with ab. *porrittii*, and in much greater numbers, and that ab. *porrittii* is the extreme form of it (in which the brown is obliterated) is proved, I think, by the fact that I

have bred it from a pairing of the "Dover form."—GEO. T. PORRITT; Elm Lea, Dalton, Huddersfield, February 10th, 1909.

THERONIA ATALANTÆ, Poda, AS BRITISH. — I have seen a fine female of this species in the British Museum, which was captured "near Ramsgate, September, 1891," but the identity of the captor is doubtful (*cf.* my 'Ichneumons of Britain,' iii. 51). This distinct and handsome species, which preys mainly upon Rhopalocera, may now be considered as certainly indigenous to our fauna.—CLAUDE MORLEY.

THE ENTOMOLOGICAL CLUB.—Since the last report (Entom. xli. 229) meetings of this Club were held at 58, Kensington Mansions, South Kensington, on December 8th, 1908, and in the Council Chamber of the Holborn Restaurant on January 19th, 1909.

On the date first mentioned Mr. Horace St. John K. Donisthorpe was in the chair, and the other members present were Messrs. R. Adkin, H. Rowland-Brown, and G. H. Verrall; the additional guests numbered fourteen. At this meeting Mr. Rowland-Brown proposed that Mr. A. H. Jones be elected an Honorary Member of the Club; this having been seconded by Mr. Donisthorpe was carried.

At the Holborn meeting, which is recognized as the "Annual" of the Club, Mr. G. H. Verrall occupied the chair, as it has been his wont to do at about the same date for the past twenty-two years. Other members present were Messrs. R. Adkin, H. St. John K. Donisthorpe, and T. W. Hall; and of other entomologists invited as guests nearly seventy attended. After supper the chairman, in proposing the toast of the "Entomological Club," made some apt remarks on the seeming lack of workers and students in British insects other than Lepidoptera. Later on, in replying to the toast of "Our Host," which was proposed by Dr. Dixey and acclaimed with musical honours by the guests, Mr. Verrall mentioned that biographical details of some past members of the Club were still wanted to complete the set of memoirs in course of preparation.

(For list of past and present members of the Entomological Club, see p. 63).—RICHARD SOUTH, Hon. Sec.

CAPTURES AND FIELD REPORTS.

EARLY APPEARANCE OF EUPITHECIA PUMILATA. — A specimen of this pretty little moth was found to-day at rest on the wall of an upstairs passage in this house, not far from a landing-window, through which it must have flown, probably attracted by an adjacent gaslight. This is a remarkably early date, but the weather for the past three or four weeks has been so abnormally changeable that one is scarcely surprised at it. After a week's hard frost, at the end of December, the New Year commenced with a spell of mild weather, which lasted until January 19th, when frost set in again, and went on until the end of the month, the last three or four days being very severe. Then on February 1st it became suddenly very mild, the thermometer for three

days rising as high as 56° and 57°, and keeping above 50° throughout the night—the sort of temperature one expects towards the end of May—but on the 6th it became cold again, and to-day there has been the heaviest fall of snow we have had for some years. The moth looks as if it had been out for some days, so it most likely emerged during the very warm weather we had at the beginning of the month. Gervase F. Mathew; Dovercourt, Essex, February 10th, 1909.

Bapta bimaculata in Lincolnshire.—I have taken *B. bimaculata* here in 1906, 1907, and 1908. These constitute, I believe, the only records for this moth for Lincolnshire.—Savignac B. Stedman; Binbrook, Market Rasen, Lincoln.

Dyschorista suspecta in Surrey.—My brother very kindly sugars for me in Surrey, and last July he sent me a series of nearly twenty specimens of *Dyschorista suspecta*, captured near Effingham. As *suspecta* is always described as a northern insect, this record may be worth insertion.—Savignac B. Stedman.

[This species was taken pretty freely in the New Forest, Hampshire, in 1896; it has also been recorded from other southern counties.—Ed.]

Notes from Haslemere for 1908.—In continuation of my notes for 1906–7 (*vide* Entom. vol. xli. p. 157), the following may be of interest:—*Limenitis sibylla* has been observed in more than one spot about here, and I imagine it is quite firmly established. I had no opportunity of obtaining the larvæ, but hope to do so this year. On June 15th I obtained ova of *Cœnonympha pamphilus* in large numbers, and the larvæ began to emerge on June 28th. They all fed very slowly, and none pupated in the autumn. I have kept them supplied with grass all the winter, and they appear to have been eating in very small quantities without any break. The largest is now little more than half an inch long. Two female specimens of *Callophrys rubi* deposited about forty ova on laburnum shoots on May 29th. The resultant larvæ appeared on June 5th, and fed up successfully on the flowers and later on the leaves of broom. The first one pupated on July 14th. Larvæ of *Zephyrus quercus*, beaten on June 3rd, appeared to be even more than usually ichneumoned, but I got through some fine imagines on July 5th and following days. After diligent searching in their known haunts I succeeded in finding ova on Nov. 4th. Spring forms of *Cyaniris argiolus* began to emerge on April 4th, though the first date on which I saw wild ones was May 27th. A brood of larvæ, which hatched on June 6th, and which began to pupate on July 11th, produced some imagines on July 30th, but several of the pupæ stood over the winter. It was difficult, especially during the later stages, to procure holly blossoms, but the larvæ, though preferring the flowers, very readily ate the young holly leaves.

Among interesting captures by day may be mentioned:—*Hylophila prasinana, H. bicolorana, Lithosia mesomella, Nemeophila russula, Hepialus humuli, Drepana binaria, Heliaca tenebrata, Erastria fasciana, Epione advenaria, Metrocampa margaritaria, Eurymene dolabraria, Numeria pulveraria, Bupalus piniaria, Pachycnemia hip-*

pocastanaria, Coremia designata, Cidaria suffumata, and *Chesias rufata.*

Larvæ of the following, among others, were taken :—*Notodonta ziczac, Thyatira batis, Gortyna ochracea, Panolis piniperda, Miselia oxyacanthæ, Agriopis aprilina, Hadena protea* ; and ova were obtained from *Pœcilocampa populi, Epunda nigra, Coremia designata, Chesias spartiata,* and many others.

From the street-lamps the most noteworthy captures were :— *Pœcilocampa populi* (in greater profusion than ever before within my experience), *Notodonta dictæa, N. trimacula, Polyploca flavicornis, Demas coryli, Asteroscopus sphinx, Eupithecia pulchellata, E. succentaureata, Cidaria siterata, C. miata, C. suffumata, C. silaceata* var. *insulata,* and *Aniatis plagiata.*

Sugaring in my garden produced :— *Acronycta psi, A. aceris, Dipterygia scabriuscula, Apamea basilinea, A. gemina, Miana strigilis, M. fasciuncula, Rusina tenebrosa, Noctua festiva, Orthosia lota, Cerastis vaccinii, C. ligula, Scopelosoma satellitia, Xanthia cerago* var. *flavescens, Epunda nigra, Miselia oxyacanthæ, Agriopis aprilina, Aplecta prasina, A. miata, Hadena protea, H. thalassina, Calocampa exoleta,* and *Xylina semibrunnea.* It is perhaps worth recording that a friend of mine, who was sugaring almost every night about three miles from my house, took two specimens of *Cymatophora fluctuosa.*

In most cases I have made no mention of the species taken by me here in previous years, the majority of which turned up again. But the interesting list of new species taken by my friend and myself in 1908 leads us to regard this as a very favourable locality, and we hope to be able to work it even more thoroughly this year. — F. A. Oldaker, M.A. ; The Red House, Haslemere, Feb. 16th, 1909.

Entomology in Cornwall and Devon in July, 1908.—Contrary to my usual custom of spending my holiday on the Continent, I last season decided to give old England another trial. Having re-read a very interesting article by Mr. A. E. Gibbs in the 'Entomologist' (vol. xxxix.) on a holiday he spent at Polzeath, and what specimens he collected there, I decided to follow out Mr. Gibbs's directions, and accordingly caught the 6.20 a.m. train from Waterloo (a comfortable corridor), which did not stop between London and Salisbury. At Okehampton we had to change into a slower train, but the scenery being so beautiful one did not regret the slower progress. I reached Wadebridge at one o'clock ; it had been raining, and I at once inquired at the station about a conveyance for getting my stock of treacle, carbide, "setting house," and other heavy luggage taken the seven miles. As luck would have it there was a carrier going that way there and then. I next asked about accommodation ; one man informed me he knew of no place where one could stay, but the carrier's boy, who now came upon the scene, informed me that there was a lady who "took people in," and I felt greatly relieved until the boy added he did not know if the lady in question was "full up" or not. However, I decided to risk it, and immediately made for the Station Hotel, and, having lunched, the rain seeming over, I mounted my bike and made a start. After a mile or so the rain came on again so much so that I took shelter under some trees ; after some time I

donned my waterproof suit and decided to ride through it, the clouds cleared, and it was then pleasant travelling, and at length I reached Polzeath. I was told the name was originally Hayle, and it was altered because the people would insist on pronouncing it as if it was the infernal regions. I found the lady was "full up," and I had to search elsewhere. The next Cove, Trebetherick, contained a boarding-house, principally used by golfers, but was then almost empty, and Mr. Buse, the landlord, made me very comfortable, the *ménage* was excellent, and the charges were very moderate. There are only two or three more houses in the place, and these are farms. The spot is really just at the mouth of the river Camel (from which Camelford takes its name). A few minutes' walk brought me down to the sea (or river, whichever one likes to call it). It seemed an ideal spot for "sugaring"—there was a row of posts, also sand-hills, and a field of thistles and ragwort—and I decided to give it a trial the same evening; but, alas, the only thing I took out of the common was *Agrotis valligera*, one specimen; *Leucania conigera*, *L. lithargyria*, and, of course, the ubiquitous *Xylophasia polyodon* were plentiful.

The next day I decided to search for Mr. Gibbs's spot, so fully described, as before stated; having discovered it, I decided to work it the same evening. I may say along the road during the afternoon I discovered a wing of *Agrotis lunigera* in a spider's web, so I knew one of the moths which I hoped to get was about. I had never taken this species, although I had tried Freshwater for it, but Mr. A. J. Hodges told me the time of appearance given by Newman is incorrect, and that is probably the reason why I had never captured the insect. I took but one specimen of *lunigera* that night. I think the place must have altered considerably since Mr. Gibbs was there; there are very few posts, and they are across a ditch and much overgrown with foliage. The other Leucanias I have mentioned appeared again. The next night I was more successful, and secured three *lunigera*; altogether I captured seven during my stay. I saw nothing of *Neuria saponariæ*, *Hadena adusta*, and *Triphæna interjecta*; never having previously taken these species, I was naturally disappointed. Mr. Gibbs thinks a house is now built on the spot where he used to get them. *M. rivata* and *E. mensuraria* were netted. I was detained a whole week by the English weather (I won't say climate). An American, on being asked what he thought of our English climate, replied, "I guess you ain't got no climate, it's all weather," and this is generally true so far as my experience goes.

The first fine sunny day I rose at seven, and cycled to St. Ives. As this article is for a scientific journal, I must not give too much of what, for want of a better appellation, I may call "domestic" news. I will then not give details of the very pleasant 'spin over the moors, up hill and down dale, in the fifty-five miles' spin to St. Ives. At Hayle Bay the sand-hills are enormous, reminding one of the Boulogne-Abbeville route. Large quantities of red valerian and wild flowers are found along the cliffs at St. Ives, but I netted nothing of importance. Delayed a few hours next day by the weather again, I was late in leaving for Land's End; I found a comfortable hotel there, and a landlord that Charles Dickens might have made use of.

He told me that if I purchased curiosities and other things he had for sale and sent them to my friends, they would exclaim, "How kind it is of my friend to send me these pretty things." Well, to return to the Lepidoptera. I treacled rocks and flowers suitable to hold that substance, and the result was the common species before mentioned. It was very lovely at Land's End, the sun was shining brightly when I left, and I had an enjoyable spin to Penzance, went over St. Michael's Mount; but if one has visited Mont St. Michel in Normandy, it is only waste of time to visit the English mount. I, however, discovered some *Silene maritima* in the castle grounds. I had been searching in vain for this plant in Polzeath in hopes of getting *Dianthœcia barrettii*; although I found some plants on my return, and visited them by night, I saw nothing of the moth. Having trained to Truro, I rode the rest of the way *viâ* Padstow Ferry to Rock (but I don't advise anyone to go this way, at least, not with a bicycle), and reached Polzeath in time to treacle the same night.

Having sent home some of my luggage, I left for Tintagel and Boscastle, sugared along the cliffs of the latter place, but had no luck. At Bude I found a few sand-hills, and had the same bad luck with regard to captures. The most charming spot I think I have ever seen (Clovelly) was reached the next day, and thence, *viâ* Bideford and Barnstaple, to the famous Braunton Burrows. I stayed at a very comfortable golf house at Saunton, above the Burrows; the latter comprise three miles of sand-hills. Finding no posts I sugared flowers, but nothing other than common species were taken. I cycled the three miles on the sands to the lighthouse, and then found I was opposite Instow, from which place I once, years ago, joined some entomological friends and went for a picnic to the lighthouse; I had no idea it was Braunton Burrows at that time. I collected a quantity of sticks, stuck them in the sand-hills, and sugared them the same evening, but the same bad luck attended me.

I may mention I was trying a new experiment on this tour; instead of "papering" my captures (readers may ask what captures? and with reason, for as yet I had very few), I was setting everything I took while fresh, and for this purpose was carrying a "drying house" with me on the front "luggage-carrier" of my bicycle; this mode of setting things when fresh is much preferable to relaxing and setting specimens after one's return home. I always experience a difficulty in relaxing and setting British moths when once they have become dry, the antennæ are almost always stiff and refuse to go in the desired position. Mr. Newman's new relaxing-tin may overcome this trouble; so far I have found it very useful, I have left an insect in for over a month without any appearance of mould. After leaving Braunton I made for Barnstaple, and soon got on the Lynton Road, which, winding as it does in and out along the valleys over moors in places and through woods occasionally, makes cycling very enjoyable. A sharp descent brings one into the picturesque village of Paracombe.

At length one arrives at the model town of Lynton, which owes its popularity largely to Sir George Newnes, M.P. A long and steep descent, rather too rough to ride down with any pleasure, and one is

in the bright little village of Lynmouth. After having selected an hotel, I made my way along the Lynn in search of the hemp-agrimony, and noting two or three likely looking places, visited these later in the evening and was rewarded by a specimen of *Toxocampa craccæ*. This moth does not settle like a butterfly, with closed upright wings as I expected, but like a *Triphæna*. I stayed three days longer in hopes of taking additional specimens, but saw no more. Along the Lynn immense quantities of valerian are found, and the cottage-gardens are full of it. It grows along the cliffs in profusion, and this is its natural habitat I conclude. In the day-time the agrimony is a tremendous attraction for all kinds of insects. *Macroglossa stellatarum*, the Vanessidæ, Theclas, and many other lepidopterous insects I saw, as well as Hymenoptera, etc., in quantities.

On leaving Lynmouth I was told I should have a three-mile walk up Countessbury Hill before I could mount my cycle, but by the aid of my 50-inch Pedersen gear I only had to push my machine for about one mile. The road continues undulating for some distance just skirting Exmoor until one reaches Minehead, where the coast is very flat. The Exeter route was now followed, passing the quaint little town of Dunster. The road winds along the valleys, and is practically downhill to Exeter. I stopped a night at Star Cross, but Dawlish Warren, like Deal and so many of our collecting-grounds, is being ruined by golfers; besides this, a railway-station has been built there, and numerous bungalows, so that there is not much ground left from an entomological point of view.

I did some hedge-beating one afternoon in hopes of disturbing *Callimorpha hera*, when I heard a voice say, "You wont get *hera* there, it is too dusty." I turned round and saw a clergyman in a trap with a harmonium; he informed me that he it was who first discovered the species there, but, he said, "*hera* is not a coast insect, it is a garden insect," and added, "you would be more likely to find it in the lanes at the back, away from the main road." This I tried, but was not fortunate enough to get a specimen; the only thing I netted was a dwarf *Pieris rapæ* exactly one inch across the wings. Feeling a bit sick of seeing my setting-boards so empty I decided to look up my friend Mr. Walker, of Torquay; this I did, and he took me to his spot for *Leucania putrescens*; we got a dozen each the same night.

I was informed that it was no use trying to catch this insect before 10 p.m.; if netted they are so wild that they soon become useless as specimens. Mr. Walker put me up to a dodge that was entirely new to me. When there are no posts or suitable places to treacle, cut a number of flower-heads of the wild carrot, treacle these and place them about in hedges and other convenient places.

We went to a fen out Newton Abbot way one night, but owing to a puncture I was not able to be there in time to sugar. *T. pastinum* is found there; the only thing at all out of the common which I got was *Noctua umbrosa*. Leaving Torquay, the next day I cycled to Exeter and trained home, after a very enjoyable twenty-three days, having seen perhaps the best of Cornwall and Devon.

I may say my "drying-house" travelled over the two hundred

and sixty odd miles, much of which was literally, "up hill and down dale," admirably; hardly a pin or brace was loose. Of course I had some "packing," consisting of some of my clothes outside the "drying-house" to lessen the jolting. I should like to add that I am desiring a companion for a three months' collecting trip to the West Indies, starting in May.—WALTER DANNATT, F.Z.S., &c.; Donnington, Blackheath, S.E.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 3rd*, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—The President announced that he had nominated Dr. Karl Jordan, Ph.D., Dr. George Blundell Longstaff, M.A., M.D., and Mr. Charles Owen Waterhouse, Vice-Presidents for the Session 1909-10.—Mr. Leopold Arnon Vidler, of the Camelite Stone House, Rye, was elected a Fellow of the Society.—The President announced the resignation of Professor E. B. Poulton, M.A., D.Sc., F.R.S., as a member of the Council, and the election of Professor Thomas Hudson Beare, F.R.S.E., to serve in his place. — Dr. K. Jordan exhibited some Oriental Papilios illustrating polymorphism, and demonstrated that in *P. clytia* and *P. dissimilis* we have to do with one dimorphic species; and that *P. paradoxa* and *P. caunus* also are forms of one species only.—Mr. O. E. Janson showed a cockroach and a beetle from the Celebes, exhibiting a remarkable case of mimicry; the former apparently an undescribed species of *Prasoplecta*, the latter identified as *Cœlophora formosa*, Crotch.—Mr. W. Parkinson Curtis sent for exhibition two specimens, a male and female of *Agrotis vestigialis*, Rott., from Purbeck, Dorset. When working the sandhills he noticed the dead female apparently sitting on the grass, and then noticed that she had a part of the male appendages attached to her. He then found the male, which a common earwig was busily engaged in devouring. The earwig, he thought, had attacked the pair *in cop.*, but he had never noticed a similar case before. Dr. T. A. Chapman felt it impossible to accept the conclusion arrived at by the exhibitor with regard to the earwig. An earwig would probably not attack a living *Agrotis*; if it did the *Agrotis* would undoubtedly repel it successfully. He suggested that some accident had happened to the moths, whether from some bird or beast there was no evidence to show.—Mr. C. O. Waterhouse exhibited a specimen of *Acridium peregrinum* from a swarm estimated to number 107,520,000, that visited Las Palmas, Grand Canary, in October, 1908; also a dragonfly, *Tramea basilaris*, a species which had occurred in such numbers on one occasion in Portuguese Congo that the natives mistook them for a swarm of locusts.—The Rev. F. D. Morice showed photo-micrographs of the "saws" in ten British sawflies—species of the genus *Dolerus*. After briefly alluding to the specific characters presented by them, to certain points in which all alike differed from the ordinary tenon-saws employed by carpenters, he invited suggestions which might account for these differences. Might it be inferred, he asked, that

the insect's saw is made to cut, not like the carpenter's saw, by a *push*, but by a *pull*, and if so, is it because the latter movement involves less risk or damage to these delicate structures through bending or breakage ? Again, what is the use of certain extremely fine denticulations on the teeth themselves, not at their apices? A discussion followed, in which Professor T. Hudson Beare supported, on the whole, the hypotheses suggested by the exhibitor. Dr. T. A. Chapman, however, was strongly of opinion that the name "saw" for these instruments, though well describing their general appearance, was misapplied as regards their function. They were really knives, all their cutting was done during the forward movement, the notches being merely a ratchet to hold one "saw" in place whilst the other advanced, as they alternately moved.—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society.—*December 10th*, 1908.—Mr. A. Sich, F.E.S., President, in the chair.—Dr. Hodgson exhibited a collection of Lepidoptera from North Queensland, including a fine series of *Papilio ulysses*, specimens of *P. sarpedon, Delias nigrina, D. nysa, Cethosia cydippe*, and several species of the brilliant genus *Danais, D. celestis, D. illustris*, and *D. sebæ*.—Mr. Harrison and Mr. Main, a bred series of *Ruralis betulæ*. — Mr. Newman, series of richly coloured specimens of *Saturnia pavonia* (*carpini*) from Kent.—Mr. Andrews, an ichneumon, *Bassus lætatorius*, female, which had been bred from a Syrphid, *Syrphus balteatus*.—Mr. Rayward, ova of *Tiliacea citrago* in sitû on the scars of the leaf-stalk of lime, and which he had found by searching.—Mr. R. Adkin, a female specimen of *Agriades bellargus*, strongly marked with blue coloration, with complete absence of the usual orange lunules on the hind wings; and a bred series of *Melanippe tristata* from ova, showing scarcely any variability.—Mr. W. J. Kaye, Herr Niepelt's types of recently described forms of *Heliconius* from Ecuador, including *H. melpomene, aglaopa*, forms *isolda, rubripicta, adonides*, and *gisela, H. xenoclea, plesseni* forms *corona* and *diadema, H. erato, estrella* form *feyeri*, and *H. xenoclea, plesseni* form *niepelti*, and commented on this grand series of graduation forms.

January 14th, 1909.—The President in the chair.—Mr. Tonge exhibited enlarged photographs of several species of Lepidoptera at rest on tree-trunks.—Mr. Harrison Main, the results of the breeding of *Aplecta nebulosa* and its forms *robsoni* and *thompsoni*, to illustrate the remarks of Professor Bateson.—Mr. L. W. Newman, *Abraxas grossulariata* ab. *varleyata*, red and yellow forms of *Callimorpha dominula*, and type and melanic forms of *Ennomos autumnaria*, with notes on the results of breeding from selected specimens during the last three or four years.—Mr. R. Adkin captured and bred series of *Aspilates ochrearia* (*citraria*), and gave details of the breeding and its results.—Professor Bateson, F.R.S., gave an address on "Mendelism," illustrating his remarks by numerous lantern slides.

January 20th.—The President in the chair. *Annual Meeting*: the Report of the Council stated that the Society had one hundred and sixty-eight members; that in addition to twenty-three meetings, seven field-meetings or visits to musuems had been made; that six

long papers had been given; that the lantern was in frequent use; that both the library and collections were constantly being referred to; and that altogether another successful year's work had been recorded. The statement of the Treasurer showed a small balance in hand, with hopeful prospects for the coming year. The President, Mr. Sich, read the Annual Address, dealing, after the obituary and some general remarks upon the Society and the entomological items of interest during the year, with references to insects by writers of antiquity. The following is a list of Officers and Council for the ensuing year:—President: A. Sich, F.E.S.; Vice-Presidents: R. Adkin, F.E.S., W. J. Kaye, F.E.S.; Treasurer: T. W. Hall, F.E.S.; Librarian: A. W. Dods; Curator: W. West; Hon. Secretaries: Stanley Edwards, F.L.S., F.E.S. (Corres.), Hy. J. Turner, F.E.S. (Report). Council: S. R. Ashby, F.E.S.; E. C. Joy; A. M. Montgomery, F.E.S.; H. Main, B.Sc., F.E.S.; A. L. Rayward, F.E.S.; R. South, F.E.S.; and A. E. Tonge, F.E.S. *Ordinary Meeting.*—Mr. Buckston, on behalf of Mr. Baldwin, exhibited two males of *Anthrocera filipendulæ* in cop. with one female; a specimen of *Euchelia jacobææ* in which the red markings were very dull in tint; and an unusually dwarf example of *Polyommatus icarus.*—Mr. Rayward, dwarf specimens of *P. icarus*, *L. arion*, *Colias hyale*, and *Euchloë cardamines*, some captured and some bred, and made some remarks on the occurrence of this form of variation.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—*November 16th*, 1908.—Mr. W. Mansbridge, Vice-President, in the chair.—Messrs. Harrison and Main kindly lent their excellent series of lantern slides, illustrating phases in the development of various interesting species of Lepidoptera and protective resemblance to resting surface, some very striking instances of this latter being shown. Mr. Taylor, of Bolton, also sent his series of slides, chiefly of Lepidoptera in their natural surroundings, and some slides of Lepidoptera taken by the Lumière direct colour process. Dr. Cotton, as well, showed photographs by the Lumière process of Lepidoptera and views in the gardens at Southport.—Mr. F. N. Pierce brought the long series of *Hydræcia nictitans*, *paludis*, *lucens*, and all the known specimens of *H. crinanensis*, being the material with which he, in collaboration with the Rev. C. R. N. Burrows, of Mucking, Essex, had worked out the specific distinctness of the four species by a study of the genitalia. Mr. Pierce described the differences of the genital appendages, and illustrated his remarks with a series of excellent photographs; he further pointed out how, without destroying the moth as a cabinet specimen, the species could be examined and recognized.

December 21st, 1908.—This was the Annual Meeting of the Society, held at the Royal Institution, Colquit Street, Liverpool, Mr. William Mansbridge, Vice-President, in the chair, and the following gentlemen were unanimously elected as the Council of the Society for the ensuing year:—President: S. J. Capper, F.E.S. Vice-Presidents: H. H. Corbett, M.R.C.S., Doncaster; Wm. Mansbridge, F.E.S.; E. R. Bankes, M.A., F.E.S., Corfe Castle; Robert Newstead,

M.Sc., F.E.S.; W. J. Lucas, B.A., F.E.S., Kingston-on-Thames C. E. Stott. Treasurer: J. Cotton, M.R.C.S., F.E.S. Secretaries: H. R. Sweeting, M.A.; Wm. Mansbridge. Librarian: F. N. Pierce, F.E.S. Council: J. Collins, Oxford; R. Wilding; O. Whitaker; Wm. Bell, M.R.C.S., J.P.; E. G. Bayford, F.E.S., Barnsley; P. F. Tinne, M.A., M.B.; W. D. Harrison; W. A. Tyerman; E. J. B. Sopp, F.R.Met.S., Wolverhampton; Wm. Webster, M.R.S.A.I.; Geo. Arnold, F.E.S.; Wm. Mallinson. Mr. Oscar Whittaker read a paper entitled "A Preliminary Catalogue of the Hemiptera-Homoptera of Lancashire and Cheshire," and additions to "A Preliminary Catalogue of the Hemiptera-Heteroptera of Lancashire and Cheshire."—Mr. George Arnold, F.E.S., read a paper entitled "Additions to the List of Hymenoptera of Lancashire and Cheshire," and exhibited the various species enumerated. Mr. Oscar Whittaker enumerated specimens of *Stenocephalus agilis* and *Corixa affinis*, recently added to the local list of Heteroptera.—Mr. F. N. Pierce exhibited a short series of *Abraxas grossulariata*, and remarked on the small range of variation shown by these specimens during the season of 1908.—Mr. C. B. Williams exhibited a number of species of Lepidoptera from Cambridge, including *Himera pennaria*, one brownish female and one male irrorated with fuscous. *Asteroscopus sphinx*; a nice series. *Cidaria miata*. *Xylina ornithopus*, and from Denbighshire, North Wales. *Polia chi*, a nice series of the typical form. *Cloantha solidaginis*, a nice series, closely agreeing with the West Riding form in darkness of coloration. Mr. Williams also announced that a specimen of *Achcrontia atropos* had been captured in Birkenhead on the 7th November last.—Mr. E. J. B. Sopp sent for exhibition a specimen of the cricket *Gryllus bimaculatus*, which was found at the Liverpool Docks in a fruit cargo from Spain.

January 18th, 1909.—Meeting held at the Royal Institution, Colquit Street, Liverpool, Mr. C. E. Stott, Vice-President, in the chair.—Mr. W. Mansbridge, F.E.S., contributed a paper entitled "Micro-Lepidoptera in Lancashire in 1907–8." The author gave short notes on the habits, occurrence, and variation in the case of insects freshly recorded by himself during the period mentioned, and exhibited most of the species thus dealt with. *Pædisca nævana* and *P. geminana* were bred last season from holly and bilberry respectively; the genitalia of these were exhibited under the microscope by Mr. F. N. Pierce, but no difference between them could be observed, excepting the loss of certain fugitive hair-tufts by *P. geminana*. The list given by Mr. Mansbridge included three species new to the published lists.—Mr. F. N. Pierce showed a series of the Carnende group of the Agrotidæ, including a small test collection sent him by the Rev. C. R. N. Burrows, which had passed through the hands of several experts, along with their comments. Mr. Pierce stated that he had now been able to differentiate with perfect clearness and consistency, by means of the genitalia, four of the species in this group, namely, *cursoria*, *nigricans*, *obelisca*, and *triticti* and *aquilina*. He also showed the genitalia of two specimens, and the wing portions of one of them, which he believed would ultimately prove either an unrecognized species or the true *aquilina*. Mr. Pierce illustrated his remarks by preparations shown under the

microscope.—Mr. Stott exhibited a fine specimen of *A. atropos*, captured by Mr. S. Redford of Fleetwood, at electric light on Fleetwood promenade.—Mr. W. A. Tyerman brought a small collection of Lepidoptera, taken in the vicinity of Hong-Kong, which included *Attacus atlas*, *Papilio paris*, and many other showy species.—Mr. J. J. Richardson showed *Peronea mixtana* from Bidston Hill, Birkenhead. —H. R. Sweeting & Wm. Mansbridge, *Hon. Secs.*

City of London Entomological Society.—*December* 1*st*.—Dr. G. G. C. Hodgson exhibited an extensive series of *Lycæna ægon* from many localities, including male with two of the silver spots on one hind wing confluent.—Mr. F. M. Edelsten, ova of *Tapinostola fulva* laid in a curled leaf of *Carex paludosa*, Norfolk, September, 1908. Mr. Edelsten stated that the female appeared to be provided with a special organ for forcing apart the edges of the curled leaf.—Mr. F. Pennington, a series of *Lycæna corydon*, including fine examples of vars. *fowleri*, *striata*, and *melanotoxa*; also *Noctua plecta* with usual costal streak only extending half way from the base, and *Apamea oculea* with pale coloration of reniform striated on surrounding nervures.—Mr. V. E. Shaw, *Satyrus janira*, Bexley, August, 1908, with left hind wing bleached save for small area at base.—Mr. L. W. Newman, *Abraxas grossulariata* entirely black with the exception of a small pale basal spot, bred from typical parents of *varleyata* female and typical male.

December 15*th*.—Mr. E. A. Cockayne exhibited *Sesia andreniformis* and its parasites *Bracon variator* and *Meniscus pemplator*; also stems of *Viburnum lantana*, showing various phases of larval borings, and the cap formed by the larva over the hole through which the imago ultimately emerges.—Dr. G. G. C. Hodgson, *Argynnis selene*, East Sussex, June, 1908, one showing a melanic tendency on marginal area of wings; another with similar tendency on basal half of wings; while a third specimen had the marginal half of the wings clouded with black broken up by fulvous dashes; in the latter specimen the under side was also abnormal.

January 5*th*, 1909.—Mr. H. M. Edelsten exhibited *Cidaria reticulata*, bred from Windermere pupæ.—Dr. G. G. C. Hodgson, *Cœnonympha typhon* var. *rothliebi* from Witherslack, *Epinephele hyperanthus* var. *obsoleta* from various English and Scotch localities, and a series of *Cœnonympha pamphilus*, including specimens with ocelli on upper side of fore wings obsolete.—Mr. A. W. Mera, *Deilephila livornica*, Torquay, 1906.—Mr. V. Shaw, *Polyommatus phlœas* abs., one with entirely black hind wings, Darenth Wood, July, 1908; the other with straw-coloured marginal band on left hind wing, Bexley, August, 1908.

January 19*th*.—Rev. C. R. N. Burrows, *Orgyia gonostigma* female with pale coloration of *antiqua* female; *Xylophasia polyodon*, a black example, Mucking, 1908; *Odonestis potatoria* var. *berolinensis* male; and ab. *intermedia* male, Mucking, 1908.—Mr. Leach, a series of *Calocampa exoleta*, Inches, N.B., October, 1908, varying from pale to dark suffused forms.—Mr. L. W. Newman, *Abraxas grossulariata* var. *varleyata*, part of second brood of thirty-one specimens, of which seven were *varleyata*; the brood was raised from typical parents,

themselves the progeny of *varleyata* and type.—Mr. V. E. Shaw, *Melanippe fluctuata* with the central band carried uniformly across the whole width of the upper wings, Bexley, 1908.—Mr. H. B. Williams, a gynandromorphous *Bupalus piniaria* with right-hand wings and antenna male, and left-hand wings and antenna female.—S. J. Bell, *Hon. Sec.*

The Manchester Entomological Society. — *February 3rd*, 1909.—Mr. C. F. Johnson, F.E.S., President, in the chair.—The President referred to the great loss the Society had sustained through the death of Mr. L. Krah, who was a most successful collector and breeder of European moths, especially Noctuæ.—Mr. W. Mansbridge, F.E.S., read a paper—"Notes on *Gnophos obscuraria*," illustrated by specimens from various localities, showing the great range of colour, practically from black to white. He referred particularly to the white forms *calceata* and *mundata* from Lewes, and expressed the opinion that the latter would soon become extinct.—Mr. B. H. Crabtree, F.E.S., showed a fine banded form (*fasciata*) from Folkestone.—Mr. A. H. Davison exhibited a specimen of *P. ridens*, bred from a pupa taken at Timperley, Cheshire, the first record for the county.—Mr. A. J. Wilson, several species of Coleoptera and stick-insects from the East, and Mr. A. Wright, Micro-Lepidoptera from the Burnley District and from Silverdale.—A. W. Boyd, *Hon. Sec.*

RECENT LITERATURE.

A Natural History of the British Butterflies, their World-wide Variation and Geographical Distribution. A Text-book for Students and Collectors. By J. W. Tutt, F.E.S. Vol. ii. London: Elliot Stock. 1908.

"Popular" books upon "British Butterflies," turned out from the press at frequent intervals, with one or two notable exceptions, continue to repeat the errors of their predecessors, being no more than compilations, and destitute of original observations in any form or shape. Mr. Tutt, at all events, leaves no excuse for this particular class of vicarious writing and its worst absurdities, while the resumption of his 'Natural History of British Butterflies' will be welcomed by all who are able to appreciate the value of a comprehensive work upon a subject which has hitherto been treated by too many writers in a purely imitative spirit. The completion of the second volume, also, must have given food for reflection to a great many entomologists who have been put in possession, probably for the first time, of the real facts connected with the life-histories of the species enumerated. To none of us, perhaps, would it have seemed possible to collect and fill four hundred closely printed pages of demy octavo with details of our five "Hairstreaks," and a single "Blue," their varieties, aberrations, and congeners, and this chiefly the harvest of original observation. But this is what Mr. Tutt has done for us, to say nothing of the chapters devoted to hybernation and æstivation,

and the gregarious and family habits in butterfly larvæ. The body of volume ii., however, is given over to the British Ruralines (Theclinæ) and *Celastrina* (*Cyaniris*) *argiolus*, with which most collectors are familiar enough in the imago state, and a first result of detailed attention to their earlier stages confirms the view that the heterogeneous classifications of previous authors—notably of Staudinger—can no longer be justified on a scientific basis. True, Mr. Tutt indulges in a kind of nomenclature that the older school will scarcely admire, and though his generic prefix for *w-album—Edwardsia*—is perforce superseded by *Chattendenia* in the pages containing "Corrigenda," the further transformation will not reconcile sticklers for form and euphony. It remains for an Entomological Congress of the future, conducted on international lines, to give finality to such things. Meanwhile Mr. Tutt makes it abundantly clear that some of the "Linnean shibboleths" will have to be discarded as the natural consequence of the wider knowledge attained in no small degree by his own indefatigable patience and industry, although, as urged in his preface, we owe a first debt of gratitude to Scudder in this respect for light and leading on the right way—that is to say, in educating us to recognize the importance of observing the living object as compared with museum and cabinet research, which chiefly concerns itself with cataloguing and orderly arrangement, in accordance with convention and convenience, rather than scientific accuracy.

But, while Mr. Tutt has provided the biological student who desires to approach the subject in a serious spirit with much solid material, he expresses himself in language which can be understood and enjoyed by that larger audience to whom natural history appeals as no more than a pleasant holiday for the mind. That, in our opinion, is the charm of Mr. Tutt's writing. An experienced and keen worker in the field, he is careful to avoid the dry-as-dust phraseology and treatment which so often discourages and repels; he is not above the inclusion of those "purple patches" which give colour and variety to highly technical subjects; into the library he imports the genial gleam of woodland, down, and heath, with which our interesting butterfly fauna is associated. If anything, the sections which include locality and habitat are treated too diffusely in the case of common insects, and some quite unnecessary repetitions might have been avoided. But in the case of our rarer species, for good and obvious reasons, we are not sorry that county records are often vague and of ancient date. Those who are in the field for purely scientific purposes will never, we imagine, have the least difficulty in getting such information as they require for legitimate purposes from their friends and colleagues.

Again, there is a refreshing absence of insularity throughout these pages. Assisted materially by the discoveries of Dr. Chapman, Mr. Bethune-Baker, and others, Mr. Tutt is able to announce even in this single volume the identity of several ranked species, especially in the wide-ranging genus *Celastrina* (*Cyaniris*); while, in the parts of volume iii. already to hand, he has established a similar state of things in the several forms of *Everes*, hitherto separated as distinct in the Nearctic and Palæarctic regions. With the admirable photomicrographic plates by Mr. F. Noad Clark, and Mr. H. Main, before us,

we can gather from the illustrations of the complex structures of ova, larvæ, pupæ, and imagines thus revealed, precisely how these results have been attained. We are also able to follow the author's chain of reasoning as it leads up to the establishment of species based upon sound scientific differentiation, discarding mere superficial marking of the wings and the external similitude of one particular stage of development, and drawing final conclusions from a review made of the whole life-history of each individual, now presented in complete sequence for the first time. The discovery of separation of species by the character of their appendages knocked on the head some old-established theories as to what constituted a species in Lepidoptera. Mr. Tutt goes further, and in the process of assigning these one or two species their proper place in the scheme of butterfly classification carries his anatomical investigations far beyond anything of the kind already attempted. We feel quite sure, therefore, that whatever affinities exist, and whatever further light may be thrown on this difficult subject, no conscientious systematist will ever again return to the easy methods complacently accepted by British and Continental authors. Mr. Tutt, we are certain, would be the first to acknowledge how large a share of the credit for this is due to those who have exerted themselves for him, and under his instructions. Yet we would remind our readers that it is only by cordial co-operation among British lepidopterists, whether engaged with biological problems or with the pleasures of field natural history, that this classic series can ever be completed. We have, indeed, comparatively few British butterflies, but those we have offer a wide field for research, still in many cases wholly unexplored. Those who are endeavouring to do this pioneer work ought to be encouraged, and we trust that the public libraries, and Natural History Societies throughout the United Kingdom will come forward to support an enterprise which should not be left to private subscription only.

H. R.-B.

Catalogue Systématique et Biologique des Hyménoptères de France. Par JULES DE GAULLE, Membre de la Société Entomologique de France. Pp. 171. With Introduction and Index of Genera, Plant-names, and Host-names. Paris: Paul Klincksieck, 3, Rue Corneille. 1908. [Extrait de la 'Feuille des Jeunes Naturalistes,' 1906–8.]

As the author of the present work very truly says, it certainly is of very considerable use to supplant the hymenopterous 'Catalogue' published by Dours in 1874 by a fresh one, bringing up to date in a concise form all that has been done in France upon the Hymenoptera during the past quarter of a century. And, indeed, when we compare the two, we get as good a conspectus as is anywhere obtainable of what the last twenty-five years has produced. Our friend M. de Gaulle pretends to no novel classification, but freely avows that he follows Dalla Torre, except where the latter has been elaborated by the subsequent works of André, Berthoumieu, Rev. T. A. Marshall, Du Buysson, the late Pastor Konow, and, unfortunately, of Kieffer. Perhaps it had been better in a few instances, such as the specific

ingredients of the genera *Barichneumon* and *Cratichneumon* which are much intermingled, if he had not so closely followed the second author cited, and a great many of Förster's genera, given by Dalla Torre, are most unnatural ones; but it is a systematist's duty to include all the divisions erected, though subsequent writers are fortunately at liberty to ignore them, if found invalid. Particularly in the Pezomachoid subgenera is this the case, since these sections are founded entirely upon alar development, of no stability in these groups; and one is led to think *Pezomachus* itself but poorly represented by thirty-four species, though many more can now be added, since we have ourself seen several species in M. de Gaulle's collection, not herein included. The grouping of the Pimplini genera is somewhat novel, though it is in no way to be condemned; and many of those among the Mesoleptini might have been dispensed with to greater advantage, especially the Försteran, though that author's really useful *Alloplasta* has not been employed for *Meniscus murinus*, Grav. The Braconids follow Marshall's arrangement in André's great work, with various doubtful improvements from Szeplegeti in 'Genera Insectorum.' The list is a full one, though it is surprising to find but forty-two species of *Apanteles* enumerated: seventy-three are British. France has evidently paid a great deal more attention to her Chalcididæ than Britain of late. The catalogue is not extensive, though very instructive, comparing favourably with that of our own species recently presented for publication to the Entomological Society of London by Mr. Claude Morley, which comprises over fourteen hundred species. It is, however, quite otherwise with the Chrysids, Ants, and, in fact, all the Aculeata; and one is led to speculate upon our insular dearth of these things. The author has conferred one real boon upon all systematists in distinctly intimating such "species" as are mere MS. names, both in Dours' 'Catalogue' and in Dr. Giraud's very excellent "Liste des éclosions d'Insectes" (Ann. Soc. Fr. 1877, pp. 397–436). Another is the addition of food-plants in the phytophagous, and host-names in the parasitic, species; as well as the establishment of the synonymy of names in Fourcroy's 'Entomologia Parisiensis' and De Fonscolombe's 'Ichneumonologie Provincale' of 1847 to 1854. M. de Gaulle, in a post-scriptum, requests that all additions to the French fauna and suggestions for the good of the Catalogue be sent him. We can do no more than return our thanks for an exceedingly valuable and laborious list, and venture to note that there is no summary of the exact number of species in the various families, subfamilies, and tribes enumerated. The total is said to approximate five thousand species, one comparing most favourably with the two thousand six hundred of the old Catalogue, though the total is suspected of reaching eight thousand when full investigation of France's Hymenoptera has been achieved.

C. M.

Annals of Tropical Medicine and Parasitology. Vol. ii, No. 4. Liverpool School of Tropical Medicine.

Among the contents are "A new Culicid Genus," by F. V. Theobald, M.A.; and "Note sur le rôle des Tabanides dans la Propagation des Trypanosomiases" par Le Dr. Edmond Sergent.

Ichneumonologia Britannica, iii. The Ichneumons of Great Britain; a Descriptive Account of the Families, Genera, and Species indigenous to the British Isles, together with notes as to Classification, Localities, Habitats, Hosts, &c. By CLAUDE MORLEY, F.E.S. Pp. i–xvi, 1–328. H. & W. Brown, 20, Fulham Road, London, S.W. 1908.

THE third volume of Mr. Morley's valuable work on our parasitic flies was published at the end of November last; it deals with the third great subfamily, the Pimplinæ, which, as the author states, is probably better known than any of the others on account of the large size and interesting economy of many of the species belonging to it. Two hundred and eleven species are included in the subfamily, and these are divided up into the following five tribes:—

Xoridides (8 genera, 15 species); Pimplides (12 genera, 106 species); Lissonotides (9 genera, 62 species); Acænitides (8 genera, 13 species); and Banchides (2 genera, 15 species).

The Xoridides prey chiefly on wood-feeding Coleoptera and Hymenoptera. The majority of the Pimplides affect lepidopterous or hymenopterous larvæ—at least one attacks the nest of the mason wasp, and a few destroy spiders or their eggs. Lissonotides are mainly associated with Lepidoptera, and rarely with Coleoptera. Of the Acænitides the hosts are but little known, and so far as has been ascertained seem to be parasitic, as are the Banchides, on Lepidoptera.

The present volume is in every way quite up to the standard of the first one, which we had the pleasure of noticing some five years ago (Entom. xxxvii. p. 52). As we then remarked, parasitical flies are well known to the rearer of Lepidoptera. How few of us, however, seem to recognize the possibility of the destroyer of our hopes being some rare or little-known species of ichneumon.

Transactions of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne. (New Series.) Vol. iii, part i. Pp. 1–222, and i–xxvii. London: Williams & Norgate. Newcastle: Mawson, Swan & Morgan, Ltd. 1908.

THE part contains, among other papers of interest, two upon entomological subjects. One of these, by Richard S. Bagnall, treats of new Genera and Species of Thysanoptera; it occupies pp. 183–217, and is accompanied by two well executed plates. The other is part ii. of a paper entitled "Catalogue of Butterflies collected in Burmah," by Lt.-Col. C. H. E. Adamson (pp. 116–148). A paper "On some Rare Arachnids captured during 1907," by A. Randell Jackson, M.B., may also be mentioned.

Twelfth Report of the State Entomologist of Minnesota for the Years 1907–1908. By F. L. WASHBURN. Pp. i–x, and 1–205.

DEALS with numerous insect pests, and the methods employed to check their ravages.

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A. E. G.

ST. MAURICE-SUR-MOSELLE

And the Vallée des Charbonniers.

THE ENTOMOLOGIST

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FIVE WEEKS IN THE VOSGES.

BY A. E. GIBBS, F.L.S.

(PLATE III.)

WHEN travelling down the Rhine Valley from Strassburg to Mülhousen a few years ago, I noticed from the carriage window on the right the long line of castle-crowned peaks of the "blue Alsatian mountains," a delightful looking country which appeared to be well worth a visit, and I determined on some future occasion to explore this tempting region. These hills form the Vosges range of Alsace and Lorraine, on the border-land of France and Germany, and across their highest peaks runs the boundary line, the scientific frontier which Bismark insisted on at the close of the war of 1870. In turning over in my mind last winter possible schemes for an entomological holiday on the Continent, not so remote from home as to make the journey too exhausting for the younger members of the party, I thought of resolves made in bygone days. So we made a hasty tour at Easter, when the hills were covered with snow and the cold was intense, to spy out the land, and to find a comfortable hotel for a few weeks' sojourn, in a centre which appeared promising from an entomological as well as a scenic point of view, with the result that we selected the village of St. Maurice-sur-Moselle at the south-west corner of the range, on French territory, as our headquarters, a choice which we afterwards found no reason to regret. St. Maurice is an industrial village of about three thousand inhabitants, situated at an altitude of 1824 ft. above sea-level, and is reached from Paris by way of Nancy and Epinal. Arriving in the evening of June 27th we found comfortable rooms had been reserved for us in the Hotel de la Gare, where Mons. Cuny, the landlord, and his good wife proved most assiduous and attentive. The next morning broke delightfully and we were astir betimes. While breakfast was being prepared under the shade of the lime tree, whose fragrant blossoms were being picked to be dried to mix with the tea, or what passes for tea in

eastern France, we got our first experiences with the butterflies of the region, by capturing *Pararge mæra* and *Aporia crataegi* which were flying in the hotel garden. Both were worn, the latter especially having seen its best days, though dilapidated females were to be met with for several weeks after this date; in fact the insect was on the wing during the whole time we were at St. Maurice. Mr. P. J. Barraud had travelled with us from Paris and remained for about a fortnight, during which time we made many pleasant excursions together. After breakfast we set out to explore the hills at the back of the hotel. Hardly had we crossed the little footbridge which spans the Moselle than I took a very fresh *Carcharodus althææ*, the only one seen during our visit. A number of specimens of *Rusticus argus* (*ægon*) were secured, a species which proved to be common in the district. On a piece of waste ground near by and in the meadows which were being mowed, *Erebia stygne* was flying, but was already getting over, and we found it difficult to pick out good specimens. Proceeding up the mountain side and capturing an occasional *Melitæa athalia* and *M. parthenie*, we saw a bigger fritillary which Mr. Barraud captured. It proved to be *Argynnis niobe* var. *eris*, and higher up the hill several others were taken. *Melanargia galatea* was well represented and in excellent condition, and the same may be said for *Lycæna arion*, some boldly-marked forms of which were obtained during our stay in the Vosges. Several beautiful specimens of *Chrysophanus alciphron* (type) rewarded a rough scramble. In the afternoon we again crossed the river and worked lower down the valley. Near the bridge my companion suddenly plunged into the brambles on the river bank and returned with a beautiful specimen of *Limenitis camilla* in his net, and a few minutes afterwards two others fell to my lot. *Polygonia c-album* was sporting in the bushes by the roadside, and an amorous pair allowed themselves to be caught without much trouble. In a bushy place on the edge of a wood *Argynnis adippe* was to be seen in first-class order. On the whole our first day's bag was a most encouraging one. Tempted by our successes we again visited the same hillside the next morning, but working up to a higher level, spending most of the time on the margin of the fir forest which crowned the summit of the mountain. On the way up, when climbing a steep grassy declivity, Mr. Barraud netted a specimen of *Papilio podalirius*, but it escaped, and although it came my way I had no better luck. This was unfortunate, as we did not again see this attractive species. The four larger Argynnids—*paphia*, *aglaia*, *adippe* (with its var. *cleodoxa*) and *niobe* (mostly var. *eris*)—were abundant; a few *Brenthis selene* were seen; the Melitæas were *athalia*, *dictynna* and *parthenie*, while *Lycæna arion* flew about everywhere. After lunch we determined to try our fortunes on the opposite side of the valley. On the high road *Pararge mæra*

was much in evidence, sunning itself on the walls and rocks, but it was so battered and torn that it was not possible to find specimens of cabinet rank, and we had to defer the capture of a series until we visited the summits of the mountains, where it was in more presentable condition. *Issoria lathonia*, after the manner of its kind, was seen to settle on the dusty road and fell a prey to the net. Crossing some marshy meadows below the forester's house on the Plain du Canon, *Brenthis ino* was found flying among the more plentiful *Melitæa athalia*. *Eugonia polychloros* was first taken on June 29th, and July 1st we visited the lower slopes of the Ballon de Servance, a locality which proved afterwards to be our most prolific hunting-ground. On an uncultivated piece of hillside, where the children were busy picking whortleberries, we first made acquaintance with *Erebia ligea*, each of us catching two of them. This insect was subsequently found flying in sunny places at all elevations above the meadows which extend up to the forest zone, and also on the open summits of the higher mountains.

In the southern section of the Vosges are found the most lofty peaks in the range, rising to a height of four or five thousand feet, the average altitude of the hills being about three thousand feet. These high points are called Ballons. Towering above St. Maurice are two of the most important of these forest-clad heights. The huge granitic mass of the Ballon de Servance, projecting into the valley and forcing the Moselle to turn north westwards almost at a right angle, rises boldly above the village and forms a watershed, the drainage on the one side being generally northwards through the Moselle and other tributaries of the Rhine into the North Sea, while on the opposite side of the divide the streams flow southward to the Mediterranean. There are forests of beech and fir on the slopes, and above them rise the rounded grassy summits almost bare of trees or bushes, the haunt of *Erebia stygne* and *E. ligea*. On July 2nd we took advantage of a motor car which runs from the station to the hotel near the summit of the Ballon d'Alsace. Arriving soon after ten we started to climb to the highest point, across which runs the frontier line. Hundreds of *E. stygne*, mostly in first-class condition, were flying in the grass despite the strong wind which was blowing, and a very good series was soon secured. A fine male *iris*, scudding along with the wind at a great pace, was taken by me on the French side of the frontier line, and while I was busy with it Mr. Barraud took a fresh female of *Limenitis populi* var. *tremulæ*. Subsequently I chased what I believed to be *L. populi* at Charmes on July 30th, but as I did not succeed in catching it that locality must not be recorded. After lunch the wind dropped a little, and we spent some time in a sheltered

valley, where on the sides of a streamlet, *Brenthis selene*, apparently only recently out of the chrysalis, and one rather worn *B. euphrosyne* were sporting among the wild flowers, while *Limenitis camilla* was netted flying round a bush. Returning to the hotel for lunch several fresh specimens of *Gonepteryx rhamni* and some bright *Vanessa urticæ* were secured. I did not again visit the summit of the Ballon d'Alsace until July 26th, by which time *Erebia stygne* had knocked itself to pieces, and *E. ligea* had taken its place as the most abundant butterfly. On this occasion a freshly-emerged female *Parnassius apollo* was found at rest on a flower-head on a steep slope just below the statue to the Virgin, which has been erected on the highest point. On July 4th, Mr. Barraud and I paid a visit to Wesserling, a German town, which was reached by coach from Bussang at the head of the St. Maurice valley. At the top of the col, at an altitude of 2410 ft., the road passes through a tunnel, and we emerge in German territory. A characteristic feature of the Vosges range is that on the western slope the descent to the level of the plains is gradual, whereas on the eastern side the declivity is very abrupt. This is well seen on the ride to Wesserling, and we ran quickly down the steep gradients to our destination. We had only about a hour's collecting at Wesserling, but it proved to be very remunerative. Crossing the railway near the station we ascended a wooded hill and were soon busy. Never, I think, have I seen such an abundance of butterflies, especially of *Argynnis paphia*, which was present in countless numbers on every bramble bush. Here we got ten specimens of *Brenthis daphne*, of which Mr. Barraud had met with a single example at St. Maurice on July 3rd. *L. camilla*, *I. lathonia*, *A. adippe* and its var. *cleodoxa*, *M. didyma*, and *M. galatea* were among the species taken. We were experiencing perfect weather, and the next day we determined to ascend the Ballon de Servance. The path led past the spot where a few days before we had discovered *E. ligea* and close by Mr. Barraud found *Hipparchia semele*, having lower down taken the first specimen of the season of *Leptosia sinapis*. Crossing the heathy slope where the commoner blues and fritillaries were sporting in the sunshine, the way next traversed the dense pine forest, where no sign of winged life was to be seen, but after a stiff climb through the gloom we emerged into a sunny meadow, where we were soon hard at work taking among other things some rather worn specimens of *Chrysophanus hippothöe*. Another short walk through the forest brought us on to the military road leading to the fort on the summit. A flowery space among the young fir trees was spied, which proved to be a veritable "butterfly corner," and where we afterwards spent many pleasant moments in the company of *Vanessa io*, *V. urticæ*, *Polygonia c-album*, *Erebia ligea*, *E. stygne*, *Issoria lathonia*, *Pararge mæra*, *Argynnis paphia*, *A. adippe*, *A. aglaia*,

Brenthis ino, *Melitæa dictynna*, *M. didyma*, *M. athalia*, &c.—more pleasant perhaps for us than for the butterflies. We lingered all too long in this attractive spot, for there was still a stiff climb to the summit, and the way again led through the forest. By the time we had gained the top and were within sight of the fort, the sky had clouded over and rain soon began to fall. We tramped through the damp grass, turning out *Erebia stygne* in abundance, but little else, and the weather becoming worse we had to seek such shelter as the rocks afforded. However, we persevered, and after a time it cleared up sufficiently for us to explore a tempting looking valley, into the depths of which we scrambled, down precipitous slopes, pushing our way through the bushes, and at last arriving at the swampy ground at bottom, which had allured us to the venturesome descent. Our exertions were, however, without reward, for there was nothing to be found worth catching, and having rested long enough to eat our lunch and feast on the wild fruits, we succeeded in finding a woodman's path which led us to the summit again. The walk back to St. Maurice yielded nothing fresh, but we had done a good day's work and added three species to our list—*L. sinapis*, *P. semele*, and *V. io*. On the following morning a visit was paid to the Vallée des Charbonniers, where the bag included a very nice pale aberration of *I. lathonia*, and in the afternoon I climbed the hill at the back of the hotel and found *Brenthis dia* sporting in considerable numbers among the bracken, enjoying the last brief moments of sunshine before the Monarch of the Day sank behind the mountain and left the hillside in shadow.

On Tuesday, July 7th, we decided to go a little further afield, and leaving St. Maurice by the seven o'clock train arrived about an hour later at Remiremont, whence a steam tramway runs among the hills to Gerardmer. Our destination was Le Tholy, in the valley of the Cleurie. It is a small village with a cotton mill, and is a great centre of the cheese-making industry. There is a little hotel on the mountain above the station, and on our way up a magnificent female *Limenitis camilla*, surely one of the loveliest of insects, was secured. A few minutes later *Cœnonympha arcana* was taken at rest on a blossom, and on the edge of a piece of woodland Mr. Barraud netted a male *Apatura iris*. Another record for the day was *Thecla ilicis* var. *cerri*, of which some four or five worn specimens appeared. After lunch a walk on the other side of the valley resulted in two more *L. camilla*, and among less noteworthy things a dwarf *Melanargia galatea*, but more curious still was a minute *Lycæna arion*, measuring only twenty-eight mm., which Mr. Barraud captured.

(To be continued.)

FOUR NEW SPECIES OF THE GENUS *ERETMAPODITES* (THEOBALD) FROM ASHANTI.

By W. M. GRAHAM, M.B.,
Director Medical Research Institute, Lagos.

THESE four new species of the genus *Eretmapodites* are forest mosquitoes. They frequent shady forest paths where there are trees overhead, and where the ground is not quite bare of vegetation. They are sometimes found perching on low bushes, but are usually nearer the ground.

Numbers 3 and 4 are the commoner species, and can be found almost anywhere in the shady forest from May to January.

I have reared females of No. 3 from larvæ taken from a hole full of a decoction of dead leaves in the root of a forest tree. I have caught the female adult on the flowers of the wild pine-apple.

All four species, in the resting attitude, carry the third pair of legs curved forward over the thorax; I have not seen them bite. They were taken at Obuasi and Kumasi.

Two other species, *E. quinquevittata* and *E. austenii*, have been described by Theobald, and another, *E. inornatus*, by Newstead, all from Africa.

A. Pale species; head covered mostly with parti-coloured flat scales. Prothoracic lobes covered with narrow, curved scales.
  1. Hind tarsi of male "paddled," of female normal, black . . . . . *oidipodeios*, n. sp.
  2. Hind tarsi of male and female normal, last two joints white . . . . . *leucopous*, n. sp.

B. Darker species, with more unicoloured flat scales on the head. Prothoracic lobes covered with flat scales.
  3. Hind tarsi of male feathered, venter of female golden . . . . . *chrysogaster*, n. sp.
  4. Hind tarsi of male normal, venter of female black and white. . . . . *melanopous*, n. sp.

1. *Eretmapodites oidipodeios*, nov. sp.

♂. The head is covered in front with dense parti-coloured (blue and white) flat scales, which project between the eyes and clothe the sides of the head, and in a triangular area behind with golden, narrow-curved and black upright and golden upright forked scales. Six long dark bristles project forward between the eyes, and posterior to them are three lateral bristles on each side of the head.

Antennæ: Plumose, the verticillate hairs pale brown. The two apical segments three times as long as the others.

Palpi: Thin, acuminate, black, without plumose hairs, shorter than proboscis.

Proboscis: Long, thin, blue-black, curved apically.

Clypeus: Dark brown, nude.

Thorax: The mesonotum is covered with narrow-curved scales. The ground colour is orange, covered in the greater part by black scales. Two parallel narrow bands of golden scales run backwards for about three-fourths of the length of the mesonotum, enclosing between them a median black band of equal breadth. Behind, the black median band is continued to the scutellum by a short band of golden scales. Laterally there are two curved bands of golden scales, which reach the hind margin just external to the lateral lobes of the scutellum. An interrupted border of golden scales surrounds the mesonotum. Two tufts of long hairs project backwards above the wing-joints.

Scutellum: The central lobe is covered with blue and white parti-coloured flat scales, almost surrounded by purple flat scales, and on the edge are four long bristles and five smaller ones. The lateral lobes are covered with golden, narrow-curved and black, narrow-curved scales, and show three long bristles and some shorter ones.

Pleuræ: The pleura is a pale golden colour, with two closely approximated spots of blue and white flat scales below the wing-point, one on the mesopleura and one on the metapleura, with a third smaller spot lower down on the mesopleura. The prothoracic lobes are covered with narrow-curved, golden and a few black scales. There are some bristles on the edge, and below on the expanded tip of the prosternum there is a patch of blue and white flat scales.

Halteres: Base pale cream, part of the stalk and the knob covered with blue-black scales.

Metanotum: A dark golden colour, with five hairs and a few golden, narrow-curved scales at the apex.

Abdomen: A velvety black, with purple reflections, the venter banded with basal white bands, which become oblique laterally and become apical on the sixth segment. There is a dorsal white band on the seventh segment. The abdomen is compressed laterally and expanded posteriorly.

Legs: A purple-black, with narrow apical pale bands on the femora of the third pair. The hind tarsi are of abnormal form and densely plumed. The fourth segment is at right angles to the third segment, and is curved. The fifth segment is as long as the fourth, and nearly straight. Long pale brown hairs hang from the distal extremity of the third segment, and the fourth and fifth segments are feathered on both sides with long pale brown hairs, those on the fourth being almost at right angles to those on the fifth segment.

Ungues: I have not been able to spare a male for dissection.

Wings: Clothed along the costa with blue-black flat scales, with a metallic lustre, and elsewhere with dark-ribbed Trichoprosopon-like scales. The first submarginal cell is narrower and one-third of its length longer than the second posterior cell. The stem of the first submarginal more than half the length of the cell. The supernumerary and mid cross-veins are close together, and the posterior cross-vein about its own length nearer the base of the wing. The sixth vein turns at right angles to the costa just before its termination. There are a few blunt flat scales on the alulæ.

Genitalia: The basal lobes are a long oval, with long curved claspers without terminal articulated spines, and covered on the basal half with flat scales, and on the distal half with some bristles. Very long, golden, stiff hairs clothe the basal lobes and project between them. I have not had material for a dissection.

Length: 4 mm.

♀. Head as in male. Antennæ less plumose. Palpi: Rather long, densely scaled, acuminate, black. Proboscis, thorax, metanotum: As in male.

Abdomen: The dorsum and sides are a velvety black, with broad oblique lateral white bands, basal on the proximal segments and apical on the sixth segment. The venter is pale gold, with apical black bands on the third, fourth, fifth, sixth, and seventh segments.

Legs: As in male, but the pale band on the hind femora is white. The hind tarsi are of normal form.

Wings: As in male. First submarginal one-third longer than second posterior, and stem of first submarginal half the length of the cell. Cross-veins as in male.

Length: 5 mm.

Habitat. Obuasi, in bush-paths, 2 p.m. to 5 p.m., in August, October, and November.

2. *Eretmapodites leucopous*, nov. sp.

♂. Head as in No. 1, but the scales are less blue. Antennæ, palpi, proboscis, clypeus: As in No. 1. Thorax: Very similar to that of No. 1.

Prothoracic lobes, pleuræ, halteres, scutellum, metanotum: As in No. 1.

Abdomen: Very similar to that of No. 1. A velvety black, with broad bands of white basal banding on the venter; these bands become oblique laterally, and apical on the sixth segment and dorsal on the seventh segment, but do not meet in the middle line dorsally. There are golden ventral spots on the sixth and seventh segments. Abdomen is compressed laterally and flattened and expanded towards the extremity.

Legs: As in No. 1, but the two last segments of the tarsi are pure white and of normal form.

Wings: Colour and scales very similar to those of No. 1. First submarginal cell one-third of its length longer than the second posterior cell. The stem of the first submarginal more than half as long as the cell. All these cross-veins are close together. Sixth vein turns at right angles to costa at its extremity.

Genitalia: Externally very similar to No. 1.

Length: 4 mm.

♀. Head as in male. Antennæ: The verticillate hairs are shorter and less numerous.

Palpi: Very short, and less densely scaled than in No. 1.

Proboscis and clypeus, pleuræ and prothoracic lobes, thorax and scutellum, and halteres: As in male.

Abdomen: The venter a pale golden colour, with brown apical

bands on the fourth, fifth, and sixth segments. The dorsum and sides are velvety black, with oblique white basal lateral bands, becoming apical on the sixth and seventh segments. Abdomen narrowed towards its extremity. Legs and tarsi: As in male.

Wings: First submarginal cell more than one-third of its length longer than the second posterior. The stem of the first submarginal is less than half the length of the cell. The supernumerary and mid cross-veins are close together; the posterior cross-vein about its own length towards the base of the wing. Sixth vein as in male.

Length: 4 mm.

Habitat. Obuasi and Kumasi, in bush; August to November at Obuasi, 11 a.m. to 1 p.m.; October, Kumasi, 11 p.m.

(To be continued.)

CURRENT NOTES.

By G. W. Kirkaldy.

1. Reuter, O. M.: "Charakteristik und Entwickelunsgeschichte der Hemipteren-Fauna (Heteroptera, Auchenorrhyncha, und Psyllidæ) der Palaearktischen Coniferen," Act. Soc. Sci. Fenn. xxxvi. no. 1, pp. 1–129 (1908).
2. Distant, W. L.: "Rhynchota, vol. iv." Fauna of British India Series, pp. 1–501, text figs. 1–282. [Hemiptera.]
3. Gillette, C. P. and Taylor, E. P.: "A few Orchard Plant Lice," Bull. Colorado Exp. Sta. 133, pp. 1–48, pls. 1–4 (September, 1908). [Hemiptera.]
4. Guilbeau, B. H.: "The Origin and Formation of the Froth in Spittle Insects," Amer. Nat. xlii. 783–98, figs. 1–8 (December, 1908). [Hemiptera.]
5. Felt and others: "Twenty-third Report of the State Entomologist of New York," Educ. Dept. Bull. no. 433 (Mus. Bull. 124), pp. 1–541, text figs. 1–49, pls. 1–44, and two text maps.
6. Doane, R. W.: "Variations in the Wing-venation in some Tipulidæ," Ent. News, xix. 405–7, pl. xvii. (November, 1908). [Diptera.]
7. Preble, E. A.: "A Biological Investigation of the Athabaska-Mackenzie Region," North Amer. Fauna, no. 27, pp. 1–574, pls. i.–xxv. text figs. 1–16 (October 26th, 1908).
8. Soar, C. D.: "The Genus *Hydrachna*," Journ. Quekett Micr. Club (2), x. 271–82, pl. 21 (November, 1908). [Arachnida.]
9. Wesche, W.: "The Proboscis of the Blowfly, *Calliphora erythrocephala*, Mg.—a Study in Evolution," *op. cit.* 283–94, pls. 22–23. [Diptera.]

10. White, G. F.: "The Relation of the Etiology (Cause) of Bee Diseases to the Treatment," Bull. U. S. Ent. 75, pp. 31–42 (December 26th, 1908).
11. Aurivilius, C.: "Hymenoptera I. Gaddsteklar. Aculeta. Sjunde Familjen. Vägsteklar. Pompilidæ," Ent. Tidskr. xxviii. 1–30, figs. 87–110 (April 25th, 1907).
12. Lampa, S.: "Om Oxstynget (*Hypoderma bovis*, DG.)," *op. cit.* 65–72, pl. i. text figs. 1–2 (September 28th, 1907). [Diptera.]
13. Wahlgren, E.: "Svenska Siphonaptera," *op. cit.* 85–91, figs. 1–2 (September 28th).
14. Id.: "Diptera I. Forsta Underordnungen. Orthorapha. Andra Gruppen Fulgor. Brachycera. Fam. 14–23," *op. cit.* 129-91, figs. 1–25 (September 28th).

There is nothing, apparently, entomological in the "Biological Investigation of the Athabaska-Mackenzie Region," but the work will be indispensable to any entomologist studying the region, whose physical geography, life-zones, vertebrata, botany, and history are exhaustively considered (7), a bibliography and index being added. It is supplementary to the previous report on the Hudson Bay Region (1902, North American Fauna, no. 22).

The Twenty-third New York Report is the bulkiest of the series, and contains much matter of interest and importance to the systematist as well as to the biologist (5). The principal paper is Needham's "Report on the Aquatic Work done during 1905" (pp. 156–248, text figs. 2–16, pls. 4–32, and 2 text maps), containing a new classification of the Tipulidæ; there are also extensive notes on the Odonata. Among the other contributions are Chadwick's "Catalogue of the Phytoptid Galls of North America" (pp. 118–55); O. S. Thomson's "Discussion of the Male Genitalia in Odonata" (pp. 249–63, text figs. 17–28); and Felt's "Further Work on the Cecidomyiidæ" (pp. 286–422, text figs. 29–49, pls. 33–44).

Reuter has treated in the fullest manner the Palæarctic Hemiptera of the Coniferæ (1). The enumeration and discussion of the species are accompanied by a very extensive bibliography. Guilbeau (4) has discussed the origin of froth in Cercopid nymphs. He says that the secretion is made up from two sources. The fluid portion is the anal secretion into which the insect by means of the caudal appendages introduces numerous air-bubbles; the glands of Batelli secrete a mucilaginous substance, which, added to the former, renders it viscous, and causes the retention of the air-bubbles. Distant (2) has completed his preliminary account of the Indo-Ceylonese Hemiptera. The work will be useful for the two hundred and eighty-two figures, many of the genera being figured for the first time. Gillette and Taylor (3) discuss at some length some orchard

aphids, and illustrate them with well-coloured plates. Eight of these aphids are also European.

Aurivilius (11) and Wahlgren (13 & 14) have treated of certain Swedish insect groups; their papers should be of considerable interest to British workers.

The titles of the other papers enumerated are self-explanatory (6, 8, 9, 10, 12).

DESCRIPTION OF A NEW CICADA FROM CENTRAL CHINA.

By W. L. Distant. 1909

Fam. CICADIDÆ.

Subfam. Gæaninæ.

Taona, gen. nov.

Head, including eyes, about as wide as base of mesonotum and as long as pronotum, the front not obliquely deflected but horizontally produced in front of and a little below the anterior margin of the vertex; ocelli somewhat close together near middle of vertex; face prominent, somewhat compressed, strongly transversely ridged; clypeus strongly compressed and reaching the anterior coxæ; pronotum about as long as mesonotum, its lateral margins nearly straight; rostrum reaching the posterior coxæ; anterior femora strongly spined beneath; tegmina and wings opaque, tegmina with their greatest breadth more than one-third their length, apical areas eight, the apical margin oblique, the apex subangulate.

Intermediate between *Gæana* and *Balinta*, allied to the first by the broader tegmina, but differing by the shorter head, which allies it to *Balinta*, from which, however, it is separated by the short and broad tegmina, and the non-deflected head in front of eyes; the compressed face somewhat straightly continued to clypeus is also distinctive. I have not seen a male specimen, so cannot describe the opercula.

Taona versicolor, sp. n.

♀. Head, pronotum, mesonotum, head beneath, sternum, legs and tegmina virescent; eyes, apices of tibiæ, tarsi and costal membrane of tegmina more or less pale testaceous-brown, the veins on basal area of tegmina fuscous-brown; abdomen bright reddish-ochraceous; wings cretaceous-white, opaque, the venation dull ochraceous; body above and beneath more or less palely pilose; posterior femora with two long strong spines beneath and a shorter and more obtuse spine just in front of the anterior spine; structural characters as in generic diagnosis.

♀. Long., excl. tegm., 27 millim. Exp. tegm., 75 millim.

Hab. China; Prov. Shen-se, Sin-ling (Wilfred A. Maw—Brit. Mus.).

NEW AMERICAN BEES.—VIII.

By T. D. A. Cockerell.

Nomada vexator, n. sp.

♀. Length, 7 to 8 mm.; ferruginous red; head, thorax, and legs marked (not heavily) with black, but with no yellow; abdomen shining light ferruginous, with no black except three spots (one basal and two lateral) on first segment, and even these sometimes hardly developed; second abdominal segment with a variable but always large cream-coloured patch on each side; third segment with much smaller spots, sometimes reduced to dots; fourth with two transverse subdorsal spots, sometimes absent; fifth with a pair of large spots, usually confluent; apex with a rather narrow band of silvery tomentum. Antennæ entirely clear ferruginous, third joint a little longer than fourth, flagellum rather thick; mandibles simple; first joint of labial palpi much longer than the other three united; middle of face, connecting with a large area enclosing ocelli, and hind part of cheeks, black; scutellum strongly bilobed; mesothorax very densely punctured, with a median black band, broadening anteriorly; metathorax with a black band, and its sides with white hair; tegulæ bright ferruginous; wings dusky hyaline, clear subapically and strongly dusky at apex; stigma ferruginous, nervures fuscous; b. n. meeting t. m.; second s. m. large, receiving the r. n. far beyond its middle; third s. m. narrowed greatly above; tibiæ and tarsi without black, but the femora marked with black, especially the hind ones; venter of abdomen red without markings. In my table of Rocky Mountain *Nomada* (Bulletin 94, Colo. Exp. Sta.) this runs nearest to *N. luteopicta*, but differs in the proportions of the antennal joints, and the pale yellow abdominal markings. The same characters, and the venation (b. n. meeting t. m.) readily separate it from *N. cymbalariæ* and *N. mera*, which run to the same point in the table. In many respects *N. vexator* resembles *N. accepta*, but the abdomen is much darker and more copiously ornamented with cream-colour in *accepta*, while the mesothorax is three banded, and there are yellow spots at the lower corners of the face.

♂. Length, 7 mm.; head and thorax black, without any red; both densely punctured, and with quite abundant white hair, which is appressed and bright silvery on face; thorax with no light markings except a cream-coloured spot on the tubercles; clypeus with the lower half (narrowest in the middle), lateral marks sending linear upward extensions to level of antennæ, scape in front, labrum, and mandibles except apex, light yellow; third antennal joint about as long as fourth on upper side, but much shorter below; scape and first four joints of flagellum black above, remaining joints showing successively decreasing infuscation: legs red, anterior and middle femora black basally beneath, hind femora black with the apex red; second s. m. narrower than in female, receiving r. n. in middle; abdomen marked nearly as in female, but basal half of first segment nearly all black, and blackish transverse stains on third and fourth; apical segments with thin white pubescence; apical plate very narrow and

pointed, entire; venter red, with black only on first segment. The markings of the abdomen are not unlike those of *N. gracilis*, but the apical plate is entirely different.

Hab. Troublesome, Colorado, alt. 7345 ft., June 9th, 1908 (S. A. Rohwer). One male and five females, the type being one of the latter.

Nomada wootonella, n. sp.

♂. A small species closely related to *N. sayi*, Robertson, but differing as follows:—Head broader, eyes more diverging above; lateral face-marks not so large below; eyes pale green; pleura with a dull yellowish spot in front; legs light ferruginous, the anterior ones largely yellowish, and the others spotted with yellow, the hind femora with a brown spot behind near apex; abdomen with the yellow markings enlarged, so that the second and third segments have very broad bands, narrowed and interrupted in the middle; apical plate entire, or with only a faint trace of the emargination which is so conspicuous in *N. sayi*. The *N. sayi* compared is an authentic specimen from Robertson.

Hab. Mesilla Park, New Mexico, April 26th (T. D. A. Cockerell). At flowers of *Sophia ochroleuca*, Wooton. Named after Prof. Wooton, of the New Mexico Agricultural College, who described the plant it visits.

Nomada civilis, Cresson, 1878.

Cresson described this from nine males collected in Colorado. It is very variable, both in size and markings. At Troublesome, Colorado, alt. 7345 ft., June 9th, 1908, Mr. S. A. Rohwer took both sexes. The female runs in my table of Rocky Mountain *Nomada* (Bull. 94, Colo. Exper. Sta.) to *N. agynia*, male, but is quite distinct from that species. As is usual in the group to which the species belongs, the female *N. civilis* is very unlike the male, agreeing, however, in the very broad face, with the orbits diverging above. The following characters of the female are distinctive:—

Lower part of face, including labrum and supraclypeal mark, lemon-yellow; orbital margins above middle of face broadly ferruginous, this continuing over to the cheek, on the lower half or more of which it gives way to yellow; scape ordinary, yellow in front, antennæ otherwise wholly ferruginous, without black or dusky; mesothorax rough, black, with a little red at extreme sides; tegulæ light ferruginous, with a yellow spot in front; tubercles and upper margin of prothorax yellow; pleura ferruginous, with a suffused yellow patch; scutellum and postscutellum yellow, with reddish hair; metathorax black, with a pair of large round light red spots, varying to slightly yellowish in the middle; legs clear ferruginous red, the apices of the femora and anterior and middle tibiæ conspicuously marked with yellow; abdomen bright lemon-yellow, with clear ferruginous bands above and below; on the first segment the yellow is reduced to a mark (one-third of a band) on each side, and

there is a black subbasal median spot; on the second segment the yellow is much narrowed in the middle.

Nomada truttarum, n. sp.

♂. Length about 8 mm., the abdomen fusiform and rather slender; belongs to the subgenus *Xanthidium*. Head broad, orbits not greatly diverging above; face with appressed silvery hair, not concealing the surface; mandibles simple; mandibles except apex, labrum, clypeus (a black sutural spot on each side), quadrate supraclypeal patch, and large lateral face-marks (filling in the whole area between clypeus and eyes, and extending from upper corners of clypeus, touching the antennal sockets, to a point some distance above antennæ) *all pale yellow*; a narrow yellow stripe, becoming reddish, extends up posterior orbital margins, and there is a ferruginous patch above summit of eye; third antennal joint scarcely over half length of fourth; scape moderately swollen, yellow in front, black behind, the junction of the colours reddish; flagellum stout and long, red, with the first five joints strongly blackened above, and the third to fifth strongly undulate; apical joint obtuse; thorax black, with the hair all white, especially conspicuous on pleura; scutellum, four rather obscure stripes on mesothorax, part of prothorax above, and a large spot on anterior part of pleura, all ferruginous; tubercles pale yellow suffused with red; mesothorax entirely black; tegulæ shining hyaline testaceous, with two pale yellow spots; wings dusky at apex, otherwise nearly clear; stigma dark ferruginous; b. n. going a long distance basad of t. m.; second s. m. large, broad above, receiving the r. n. at the beginning of its last third; third t. c. abruptly bent; legs red, without yellow, except that the anterior femora are suffusedly yellowish in front; a little black at base of anterior femora, more on middle femora, and hind femora broadly black beneath except at apex; abdomen rather well punctured; first segment black basally, and with the broad band red without any yellow; second segment red, with an exceedingly broad lemon-yellow band, narrowly interrupted in the middle (by a longitudinal red band) and notched at each upper lateral corner; segments three to six red with yellow bands, on three and four widely interrupted, on six a median patch, not reaching the sides of the segment; apical plate broad, strongly notched; venter red, suffused with blackish, and with a large diamond-shaped yellow spot at extreme apex. In the tables of Rocky Mountain *Nomada* runs to *N. vicinalis*, Cresson, from which it differs by the large lateral face-marks, first abdominal segment without yellow, &c.

Hab. Trout Spring, Gallinas Canyon, New Mexico, May 24th (T. D. A. Cockerell).

Osmia malina, n. sp.

♀. Length about 9 mm., thick-set, brilliant dark indigo-blue, the hind margins of the abdominal segments concolorous and very narrowly impunctate; legs black, without metallic tints; antennæ entirely black. Face broad; hair of face and vertex coarse and black, but on each side of the antennæ is a patch of white hair, recalling the

appearance of *O. albolateralis*, which is in other respects a very different species. Lower edge of clypeus black, slightly elevated, but not peculiar in any way; mandibles with two pointed teeth, and a truncate subemarginate inner one; hair of cheeks black, but a conspicuous tuft of white hair on prothorax at sides of base of head; tubercles with white hair, pleura with black, sides of metathorax with white; dorsum of thorax with mixed black and white hair, the black preponderating, except posteriorly, along hind margin of scutellum; wings very smoky; legs with short black hair, shining brownish on anterior and middle tarsi; abdomen with white hair on first segment and extreme base of second; the other segments with short black hair, with a few light hairs intermixed on second and third, and much glittering white hair on fifth; scopa and hair at sides of abdomen black. Superficially like *O. wilmattæ*, Ckll., but distinguished by the second s. m. more produced beyond the second r. n., the thorax above with much more black hair, the larger ocelli and the tufts of white hair on the face. From *O. giliarum*, Ckll., it is known by the abundant black hair on the thorax above, and the white hair on face. From *O. pikei*, Ckll., it differs by the broader, deep blue face, &c.

Hab. Northern Colorado, in the region near the foothills, either in the vicinity of Boulder or Loveland (Clarence De Voss).

Osmia (*Acanthosmioides*) *nifoata*, n. sp.

♂. Length, 9 mm.; dark greenish blue, the abdomen shining; hair of head and thorax entirely white; flagellum black or almost above, ferruginous beneath; apical tooth of mandibles very long, the other subobsolete, broadly obliquely truncate; tegulæ blue in front; wings clear, a little stained along the veins; legs black with strong metallic tints, especially on the femora behind; hair of legs partly light and partly dark, the anterior and especially the middle tibiæ conspicuously fringed with white hair behind; hind femora strongly swollen, their hair largely black; hind tibiæ conspicuously bent; inner side of hind basitarsus with dark fuscous hair; first abdominal segment with white hair, second with white and black, the others with black, a little white near hind margin of third; sixth segment entire; seventh bidentate; second ventral longitudinally grooved, and with a short compressed apical tooth, scarcely a third the length of the segment. As in *O. odontogaster*, the ventral tooth is sometimes slightly bifid at the end. Distinguished from *O. odontogaster*, Ckll., by the entirely different colour, and broader abdomen. It is nearer to *Osmia ashmeadii* (*Acanthosmioides ashmeadii*, Titus), but differs from that by the much darker flagellum and the absence of a carina on the first ventral segment. The eyes are sage-green.

Hab. Troublesome, Colorado, 7345 ft., June 8th and 9th, 1908; three males (S. A. Rohwer). This is the first *Acanthosmioides* from the Rocky Mountains.

NOTES ON BRACONIDÆ.—IX.: ON THE REMAINDER OF MARSHALL'S COLLECTION.

By Claude Morley, F.E.S., &c.

I found but little to note on going through the remainder of this valuable collection at the beginning of March. Such facts as are noteworthy relate to the synonymy and rectification of the British list.

Meteorus brevipes, Wesm.: In the second volume of his 'Bracon. d'Europe' (André, 1891), Marshall inserts this as an insufficiently described species at the end of its genus, with the remark, "Belgique (Bruxelles); un seul examplaire connu." Subsequently he evidently succeeded in recognizing it, for in his collection are eight males from Botusfleming, St. Albans, and Cornworthy. It is somewhat similar superficially to *M. filator*, Hal., though of stouter conformation.—*Calyptus ruficoxis*, Wesm.: One female is from "Darenth Wood"; it was only previously recorded from Belgium and Holland.—*Alloa contracta*, Nees, male, is synonymous with *Lamadatha testaceipes*, Cam.!—*Blacus humilis*, Nees, is a very doubtful species, and is, at least temporarily, sunk to *B. trivialis*, Hal.—*Blacus aptenodytes*, Marsh., is a synonym of *Blacus mamillanus*, Ruthe.—*Aphæreta major*: Marshall erects a form he had previously (André, 'Bracon. d'Europ.' ii. 401) considered a variety of *A. cephalotes*, Hal., to the dignity of specific rank under this name, and records it from "Angleterre." The type is not in his collection.—Haliday's two species of *Prosapha*, Först., are now synonymised under the earlier name, *speculum*, Hal.—*Aspilota distracta*, Nees, is a variety of the same author's earlier described "*Bassus*" *concolor*.—The British Museum collection of British Aphidiinæ (Flexiliventres) is peculiarly full; it contains many of Haliday's original specimens, a large collection, together with the Aphididous hosts from Bignell, and all those in Marshall's possession; others from Stephens's and Desvignes's collections have not yet been amalgamated, through lack of time to synonymise the old (and often MS.) names under which they at present stand.

Ditherus ruficollis, Cameron, the male type of which was acquired by the Museum authorities in 1902, is nothing but a synonym of *Cardiochiles saltator*, Nees. It is here represented by both sexes, *ex coll.* Sir S. S. Saunders, from Albania; *ex coll.* Ruthe, from Germany; and *ex coll.* Marshall, from "Caucase."

The National Collection of British Braconidæ is now rearranged.

Monk Soham House, Framlingham, Suffolk.

NOTE ON THE SUPPOSED LARVA OF *PIMPLA OCULATORIA*, F., FIGURED IN MORLEY'S 'BRITISH ICHNEUMONS,' VOL. III., 1908, AND ITS LOCATION AMONG THE DIPTERA.

By J. E. Collin, F.E.S.

Mr. Claude Morley has described and figured on p. 114 of his latest volume on British Ichneumons what he supposed might be the larva of *Pimpla oculatoria*, F., found in an egg-bag of *Epeira diadematа*, taken from under the coping of a garden wall in Ipswich; this larva cast its skin soon after he found it, but ultimately died.

To Mr. Morley this was an "ichneumonidous larva of most unusual form and colour;" still, the known fact of the association of *P. oculatoria* with spiders, and of its having been bred from the egg-bag of this particular spider, naturally led him to believe that the connection between the larva he found and the ichneumon, though "unsatisfactory," was "extremely probably correct."

My attention was attracted to his figure by its great similarity to the larvæ of some Diptera, while the fact that Mr. Morley had found in another egg-bag of the same spider given to him by the Rev. O. Pickard-Cambridge one similar larva-skin with "the very distinctive rostrum of the . . . described larva," and in the same egg-bag were four cocoons of the *Pimpla*, favoured the conclusion that this must be a Dipterous larva with the *Pimpla* parasitic upon it.

Mr. Morley generously allowed Dr. Sharp to examine the larval skin, and he writes: "It is no doubt that of a Dipteron of the family Stratiomyidæ. From its appearance it may have been parasitised; it has, at any rate, not been naturally cast off."

It would therefore appear that there must be a species of Stratiomyidæ, living in the larval state upon the eggs of *Epeira diadematа*, though the present knowledge of the larval habits of the family in no way supports the possibility of such an occurrence. The only genus of Diptera in the neighbourhood of the Stratiomyidæ, said to have been bred from the cocoons of spiders, is *Acrocera* (Cyrtidæ), but the presence of *Acrocera* in the middle of Ipswich would be somewhat remarkable.

It remains for someone to clear up this interesting question by rearing one of these larvæ, which unfortunately Mr. Morley failed to do.

[That the attack upon the spiders' egg should be in the form of hyperparasitism has never before been suggested, and certainly did not occur to me when writing my article upon the subject (Ichn. Brit. iii. 113–115), which is certainly worthy of very close attention (*cf.* Grav. Ichn. Europ. iii. 154; Westw. Mod. Class. ii. 143; Laboulbène, Ann. Soc. France, 1858, p. 800,

et *lib. cit.* 1871, p. 444; Brischke, Schr. Nat. ges. Danz. 1880, p. 113; Rogers at Meeting Ent. Soc., 2nd April, 1866, *et* Johnson, E.M.M., 1907, p. 160).—Claude Morley.]

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By George Wheeler, M.A., F.E.S.

(Continued from p. 32.)

There is one more named form belonging to the *navarina* group, which was originally supposed by de Sélys-Longchamps to be *asteria*, and so named by him, doubtfully, in his 'Énumération des Insectes Lépidoptères de la Belgique,' in 1845. In 1857, however, it was given as an aberration of *athalia* ('Annales de la Société Entomologique Belge, vol. i. p. 19) under the name of *asteriades*, de Sélys-Longchamps, and is briefly described as "très petit et très noir."

With regard to the greater variety of colouring on the upper side, in which some specimens, especially females, approach nearer to the *Aurinia*-group, there seems to be only one named form in which this peculiarity is prominent, and even in this case the insect seems to be named rather after a peculiarity of the un. s. h. w. than from anything in the appearance of the up. s., viz.: *leucippe*, Schneider, 'Systematische Beschreibung,' p. 209 (1787). This form was described as a distinct species, in the following terms: "Alis dentatis, supra fuscis, primoribus ad marginem luteis striis duabus venisque nigris; posterioribus serie triplici macularum pallidiorum et subtus fasciis fulvis flavis et albis." Reference is made to Esper's 'Schmetterlinge Europas,' pl. xxx., fig. 2, which, in spite of what Schneider says to the contrary, shows it to be a female aberration of *athalia*, with suffusion extending over the basal half of each wing, and having the lunules on the up. s. h. w. lighter, and the ground colour between the outer and inner lines redder than usual; the very narrow streak of ground colour showing within the inner line is of normal colour. The un. s. f. w. has in places a redder shade than usual, and the elbowed line is clearly marked by large black spots throughout. The h. w. has the terminal lunules, the outer half of the central band, the light spot, and part of the basal band white; hence, it would seem, the name. Schneider regards this form as being included in Linnæus' *maturna*, showing that the variation of colour on the upper side was in his eyes very noticeable. Seba's illustration ('Thesaurus,' pl. iii. A., figs. 1–4), to which he refers, appears to me, so far as it is possible to judge, to represent *athalia*. To Petiver's 'Icones Papilionum Britanniæ,' I have unfortunately been unable to refer, as there is no copy of this work in the British Museum, nor in any of the other great London libraries.

An aberrational form of this species was described and figured in the 'Bulletin de la Société Lépidoptérologique de Genève,' vol. i. pt. iii. p. 262, pl. 8, fig. 5 (1908), under the name of ab. *alba*, Rehfous. It is described as follows: "la couleur du fond, normalement fauve, est remplacée par du blanc pur. Sur le dessus des ailes il ne reste pas la moindre parcelle de la couleur normale; les dessins foncés n'entourent que du blanc. Dessous, de legères traces de fauve se retrouvent sur les nervures et de chaque côté des lignes noires."* This appears to be a singularly perfect form of albino, for the colouring matter is absent not only from the ordinary fulvous scales but from the feathery portion at the base of the wings, from the fringes, and to a great extent from the palpi and legs. This example was taken at Iselle on the south side of the Simplon on July 14th, 1907, and in the same paper another similar specimen is mentioned as having been taken near Geneva on July 13th, 1904. With regard to the species to which these aberrations are referred, the dates would seem to leave no doubt as to the correctness of the diagnosis, even if the illustration of M. Rehfous's specimen were not in itself conclusive. In a footnote it is added that the name is intended to serve as a concise description, and to apply not only to the species to which these particular examples belong but to similar aberrations of other species; *M. dictynna*, *M. didyma*, *Argynnis* (*Brenthis*) *selene*, and *A.* (*Issoria*) *lathonia* are specially mentioned. It will indeed be an advantage if this extended definition be accepted and adhered to more completely than has been done in the similar but far more extended case of the Lycænid aberrational forms dealt with by Courvoisier in the 'Bulletin de la Société Entomologique Suisse,' vol. xi., pt. i., pp. 18–25, pl. ii. (1903), where general names applicable to all the usual forms of aberration common to several species were suggested. Some of these were no doubt barred in certain cases by the "law of priority," but in all others these names ought certainly to have been accepted, even if this be not a case (as I most strongly hold it to be) where this apparently iron law of priority should have been made to bend. Surely it is not now outside the range of practical politics to press for the formation of an international council by which all such questions should be definitely decided? There are, of course, certain obvious difficulties in the way, and in making the attempt, others, unforeseen, would probably come to light, but none appear to be of such a character as to be necessarily insurmountable, and the result in clearness of meaning, in saving of time and labour, and in turning valuable

* The ground colour, normally fulvous, is replaced by pure white; on the upper side of the wings there does not remain the slightest particle of the normal colour, the dark design surrounds nothing but white. Beneath, slight traces of the fulvous again appear on the nervures, and at each side of the black lines.

(and in some cases invaluable) energies into a more profitable channel would be incalculable.

(To be continued.)

NOTES AND OBSERVATIONS.

The Coccid Genus Ceroputo.—Having occasion to examine some material of *Ceroputo calcitectus* (Ckll.), collected by Mr. E. Bethel on *Agropyron* at Canon City, Colorado (the species new to Colorado), I chanced to notice the resemblance of the male, especially in the venation, to *Monophlebus trivenosus*, Germ. & Ber., from Baltic amber. Upon comparing the figure of *M. trivenosus* with a male *C. calcitectus* it became evident that they were congeneric, so the amber fossil must be known as *Ceroputo trivenosus*. The only noteworthy difference between the two is that the caudal style is considerably shorter and broader in the fossil.—T. D. A. Cockerell.

A Little Work on Spiders.—Though the study of spiders is not considered strictly a part of entomology—at least, in Britain—yet most "general entomologists" take some interest in them. Possibly the lack of a cheap, convenient, modern manual has deterred many from paying attention to these interesting forms. Recently I have had occasion to work up the spiders of the Hawaiian sugar-cane fields. Many of these are immigrants, and although, of course, Simon's great volumes are indispensable to any serious spider work, yet I have found a more modest little book very useful in giving me a preliminary idea (in the absence of a reference collection) of these immigrants at the outset of my studies, as Simon's 'Histoire Naturelle des Araignées' does not deal fully with species. Planet's "Araignées," published in 1905 as the fourteenth part of Deyrolle's 'Histoire Naturelle de la France,' has not, I believe, been noted as yet in the 'Entomologist,' but will, I am sure, be very useful to any British entomologist who is at all interested in spiders. It is portable, cheap, runs to 341 pages, 18 well-executed plates, and 230 text figures, making a total of 370 figs. As the proof-sheets were read by Mr. Simon, the accuracy of the volume is guaranteed.—G. W. Kirkaldy.

Acrolita consequana, H.-S., in Devonshire.—I have to record the discovery of the larvæ of this local Tortrix by my wife in South Devon in July, 1907. They were feeding on the seed-heads of the spurge (*Euphorbia paralias*) on the sandy flats near the sea. The imagines, seven in number, duly emerged on August 6th following. They are smaller than usual, owing no doubt to the drying of the food-plant on our return home. I am indebted to the kindness of Mr. E. A. Atmore, F.E.S., of King's Lynn, for confirming the identity of the species. As far as I can discover it does not appear to have been recorded for this county before. Mr. Stainton describes it under the name of *Pœcilochroma hawkerana*, and gives as its locality "on the Hampshire coast" ('Manual,' vol. ii. p. 239). Mr. Meyrick records it from Hants and Dorset ('Handbook,' p. 505). Mr. Barrett, on p. 73, vol. xi. says: "It is only known to be found in Hayling Island,

Bournemouth, the Isle of Portland, and the Chesil Beach, in the counties of Hants and Dorset"; whilst I find no mention of it in the 'Victoria County History of Devonshire.' — C. GRANVILLE CLUTTERBUCK, F.E.S.; Heathside, Heathville Road, Gloucester, March 15th, 1909.

RECENT SALES OF LEPIDOPTERA AT "STEVENS'S."—The first portion of the valuable collection formed by the late T. Maddison, Esq., of Durham, was offered in six hundred lots on February 23rd and 24th last. It embraced a large number of aberrations, and for many of these there was keen competition among bidders. Thirteen varieties alone realized a total of £103, made up as under:—

Gonepteryx rhamni, a specimen with the disc of the wings of a dull orange colour. £6 10s.

A superb rayed variety of *Argynnis paphia*, female; fore wings, except base, very dark and suffused, the under side of hind wings with base and margins silvery, central fascia green (New Forest, July, 1899). £8.

A female of *A. aglaia*; hind wings with broad dark bands, from which rays extend to margin (from the Linnean coll.). £9 10s.

A. euphrosyne.—A unicolorous tawny orange var.; dark markings obsolete, except at base of wings (Abbot's Wood, 1897). £9.

Melitæa athalia.—A very unusual aberration; obscure, with central band of pale spots on under side of hind wings; (Abbot's Wood). £9.

A black variety of *Vanessa antiopa*, with outer costal blotch obsolete (Sherburn, August, 1892). £7.

A remarkable aberration of *Vanessa polychloros*; margin irrorated, costal blotches united (New Forest, June, 1902). £7 10s.

A very fine dark variety of *Apatura iris*; white markings almost absent (from the Stevens coll.). £7.

The fine aberration of *Epinephele tithonus* figured in the 'Entomologist' for October, 1897. £8 10s.

A golden brown male specimen of *E. ianira* (Polegate, June; Entom. xviii. 320). £6.

A specimen of *Arctia caia*, with the fore wings brown shading to lighter, and the hind wings entirely deep yellow (bred, Liverpool, 1905), secured the highest bid of the sale, £13.

An exceptionally dark aberration of *A. caia*, with the hind wings almost entirely shiny black (from Mason's coll.). £6.

A black male *Dicranura vinula* (Scarborough, 1898), with two other aberrations of the same species. £6.

(To be concluded.)

CAPTURES AND FIELD REPORTS.

LARVÆ OF LEPIDOPTERA IN NOVEMBER. — Is it a recognized entomological device for collecting larvæ in autumn to beat the heaps of bracken cut for fodder over a tray? By doing so in November last year I took an extraordinary number of larvæ, including about four hundred *Phragmatobia fuliginosa*, and some *Parasemia plantaginis*,

Argynnis selene, *Cosmotriche potatoria*, *Aplecta tincta*, *A. nebulosa*, *Noctua brunnea*, *N. triangulum*, and *Triphæna pronuba*, with several Geometrids. I took these in two or three days in woods near Oxford. C. Mellows; Oxford.

RECENT LITERATURE.

The Genitalia of the Group Noctuidæ of the Lepidoptera of the British Islands. By F. N. Pierce, F.E.S. Pp. xii., 88, pls. xxxii. Liverpool: A. W. Duncan, 65, South John Street. 1909. 7s. 6d.

This book marks an era in the study of the British Lepidoptera. Mr. Pierce tells us it is the outcome of twenty years' study, and many students of British Lepidoptera during that period have known him as expert in making preparations of the organs here treated of and as learned in the study of the specimens so treated. The magazines during that period report many instances in which questions of specific identity or differentiation have been referred to him for investigation, not only in the Noctuæ but more or less throughout the Lepidoptera, and always with a result advancing our knowledge.

The volume is the first attempt that has been made to describe these appendages throughout a whole family of the fauna of a district. There are figures of the genitalia of some three hundred and fifteen species, the Noctuæ of the British Islands. Of course, this is after all but a flea-bite to what an examination of all the Noctuæ would be, the Catalogue of these by Sir George Hampson presenting a vista of almost interminable volumes.

The earliest observations on the genitalia of the Noctuæ that we recollect are those of Lederer ('Noctuinen Europa,' 1857); he figures the end of the clasp in thirty species. It is interesting to note that his figures are crude to the last degree, yet illustrate that these parts vary in the different species. Down almost to the present time we find much vagueness in figures of these organs, as in a recent illustration in a German periodical figures appeared of the genitalia of *Everes argiades* to prove its identity with *alcetas*, yet the figures would have served equally well for *Cupido minimus* or even *sebrus*. Even Scudder's figures are often rather vague, and quite inadequate to convey any very definite idea of the structures, and would often fail to distinguish allied species, although they are very nicely drawn.

One of the earliest really satisfactory plates of male appendages of Noctuæ is plate xi. in the first vol. of 'Iris' (1884) of four species of the *lucernea* group of Agrotids.

Dr. K. Jordan's figures in the Novit. Zool. are certainly far and away the most excellent in all respects. His account of the appendage of the Sphinges is certainly the most complete and accurate piece of work of this class that exists, and though only part of a general monograph of the Sphinges, is itself a most important monograph, and one wishes it were less enfolded with the other material. It includes of course our British Sphinges, but these are so few species that it hardly strikes us that it is dealing with a British family.

Those who still retain any doubts as to the value of these organs

for descriptive purposes must surely lay them aside when they look at the figures in this volume, where, in the three hundred odd figures, it would be impossible to find one that could be confused with any other. Mr. Pierce says he sees no difference between *favicolor* and *pallens* except size, yet if his figures can be relied on there is considerable difference in some of the proportions and in the spinous armature of the *cucullus*. It is a case like this in which a photograph, even a poor and imperfect one, would much exceed in value any drawing. There are, however, two circumstances which make the appendages rather more valuable than any other structure, or even than a combination of other characters, for the decision of a question either of specific distinction or of generic or familiar alliance. One of these is that so long as two forms remain one species, that is, are syngamic, or breed together, directly or indirectly, these parts are kept identical in both. As soon as they become distinct species, divergence of the parts is liable to occur, perhaps rapidly. Only syngamy can keep these structures uniform throughout a group of forms. When syngamy ceases, they are free to vary, the only necessity being that they remain identical throughout each syngamic group. But their variation is not restrained by any such question as adherence to a food-plant, avoiding particular enemies, &c., as nearly all other characters used to define species are characters that are kept constant by natural selection. The other circumstance is that they are highly organised and for the most part hard, chitinised structures, so that they afford many details for observation and these details are embodied in forms less difficult to seize than many such items as colour, wing markings, &c.

It is now well known, Dr. Jordan having perhaps most clearly pointed the fact out, that geographical races have these appendages varying a little in each race. In some cases, when the segregation is great, these no doubt mark incipient species; when the segregation is incomplete, as at the extremities of an extended habitat, there may be a difference that is prevented from becoming great by mediate syngamy.

When there is immediate syngamy throughout a group of forms (unquestionable species) we may expect to find great uniformity throughout the group, but it is highly probable that in such a group variations may take place very rapidly, the whole group moving together. This seems a conclusion inevitable from the many instances we meet with in which the appendages are extremely different in closely allied species.

Unquestionably the appendages, like everything else, are under the control of natural selection, but as to what the circumstances are that tend to govern the selection, we are certainly at present very much in the dark, so that if our argument seems to suggest that they have escaped its control, all that is postulated is that they are not controlled by any of those items of environment that have to be counted on by most other characters, and that as a result two newly established species may retain by force of similar environment a very similar facis and structure in everything but these structures, which are free to vary to any extent if only they vary together throughout each specific group.

Some of the most difficult problems met with in the study of these genitalia are involved in the striking discovery that our *H. nictitans* consists not of two species or possibly three, as Mr. Tutt established a considerable time ago, though not perhaps incontestably, but actually of four very distinct species, barely capable of being distinguished from each other without reference to the appendages (there is no great difficulty in separating typical English *paludis* and *nictitans*). An examination of the appendages suggest, nevertheless, that *crinanensis*, the new species discovered in his researches by Mr. Pierce, belongs not only to a distinct species but that it should be placed in a separate genus. The query then presents itself, Is this a derivative from the *nictitans-paludis-lucens* forms, or is it by mimicry or some other reason approaching them from elsewhere? We have never quite satisfied ourselves, perhaps from want of proper enquiry, that Pierce's species *lucens* is identical with *nictitans* var. *lucens*. At any rate, *lucens*, Pierce, is to be found amongst series of simple *nictitans* in collections, and *nictitans* var. *lucens* is very commonly really *nictitans*. We have a strong suspicion that *nictitans*, Pierce, and *lucens*, Pierce, both have forms that are erronously regarded as respectively *nictitans* and *lucens*. We find no discussion of these questions in "The Genitalia."

We miss also any discussion of the question as to *Noctua thulei*, Stgr. (*conflua*, Tr. ?). Mr. Pierce mentions *conflua* as identical with *festiva*, but says nothing as to what he means by *conflua*, whether the mainland var. of *festiva*, or the distinct or semi-distinct Shetland form.

It must be recognised that all such questions can only be authoritatively solved by exploring also the allied species; only so can the amount of difference necessary to prove specific identity or otherwise be gauged, as, for instance, *Everes argiades* and *alcetas* and *Cupido minima* have appendages that, at first glance, are absolutely identical, but minute, constant differences can be detected that make them clearly three species. On the other hand, *Plebius ægon* has variations between individuals, even between the opposite clasps of one individual, that exceed in amount the difference that in the Everids just referred to distinguishes species.

Mr. Pierce's work will no doubt give an impulse to the study of the genitalia of the Lepidoptera, calculated as it is to give much assistance in their study. Though very complete, it nevertheless suggests various directions for further study; the marvellous structure of the "Vesica" (Pierce), an investigation of the curiously aberrant forms in *silago* and *oxyacanthæ*, are only a little more obvious than many other points for investigation.—T. A. C.

Critical Notes on the Classification of the Corduliinæ (*Odonata*). By J. G. Needham. Columbus, Ohio, December, 1908. (Annals of the Entom. Soc. of America, i. No. 4).

We have here a system of classification of the genera of the Corduliines of the world based on wing-venation. Two diagrams explain the terms employed. Students of the Odonata will find this short article of much interest, Mr. Needham having been so long at work on these insects.—W. J. L.

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THE FOOD-PLANT OF *L. ORBITULUS*.

BY T. A. CHAPMAN, M.D., F.Z.S., &c.

LAST summer (1908) I met with *L. orbitulus* abundantly in several of the valleys south of the Rhone, but especially in the Binn Thal, in the first week in August. I had the pleasure of observing it ovipositing in various localities on the slopes of the Holzerspits. The plant on which the butterflies were laying was *Androsace* (*Gregoria*) *vitaliana*.

Having ascertained this, I noticed that this plant was common wherever the butterflies were most abundant. The plants where the butterflies flew were beyond the flowering season, possibly two or three weeks, but 1000 ft. or so higher up, where there were no *orbitulus*—in fact, at about the highest limit of the plant—it was still in flower, each plant presenting a beautiful patch of crowded yellow flowers. The butterflies laid on and under the leaves near the summit of each branch or rosette of leaves.

The larvæ hatched in seven or eight days, and fed freely on the leaves of the plant. I succeeded in getting several larvæ full-grown in the first skin, but failed to get further. The plants I brought home with me soon died, and some I succeeded in getting from a nursery were covered with aphides and very unhealthy, and soon died, although I managed to clear off the aphides, and so the experiment came to an end. I was thus unable to tell at what stage the larva hybernates; it can hardly be later than the second instar, though on the sun-baked slopes where much of the plant grew no doubt rapid progress might be made.

However, I have determined the food-plant, which is important, and have obtained photographs of the egg (by Mr. Tonge), and obtained a preparation of the larva in the first instar showing its structure, well photographed by Mr. F. N. Clark.

I add a note on the colouring, &c., of the larva when full-grown in the first instar. My note was made on September 5th,

1908 :—There are now visible two young larvæ very nearly full-grown in their first instar. There may be others present, but unfortunately various rosettes of the plant have died or are dying, and it is feared the larvæ on these have strayed away or have died. The plants have been nearly cleared of aphides, but it is not certain that these were the cause of their unhealthy state. The larvæ still thrust their heads into the fleshy interior of the leaves, mining out the tissue and leaving the upper and lower cuticles as colourless pellicles. The larvæ are nearly 2 mm. in length, and are pale reddish, with the dorsal crest-hairs black; they are very evident when on a green leaf, but match very closely the reddish dead leaves below the growing rosette. Their ground colour is compounded of a pale, almost yellowish, ground colour and dark reddish-brown markings. The dorsal line is broadly red (brown), the lateral line pale. Above the lateral line is a dark band, then a pale one slightly echelonned, as bounding below, the next dark line, consisting of the oblique lateral lines sloping downwards and backwards. Between these and the dorsal band is a pale area, widest at the posterior margin of each segment, and having a dark central spot. Beneath the lateral line is a darker shade (paler than the dark of upper surface), and then the pale ventral area.

NOTE ON THE PUPATING LARVA OF *ATTACUS EDWARDSII.*

By J. Henry Watson.

In a batch of cocoons sent me from Calcutta, and despatched thence on February 5th, was one cocoon that had a dull sound on shaking it, as if the moth had become ready to emerge. I opened the cocoon to see, and was very surprised to find that the larva had never shed its skin, and had not advanced in its pupation (after completing its cocoon) more than about five days—that is to say, it had become dormant, and in this state had travelled to England. At the time of writing it has been at least a month in cocoon. The head, which is opaque and yellow, is still retractable within the first thoracic segment, and has the jaws, spinerette, and palpi quite and freely movable; but the antennæ are withdrawn apparently from the larval antenna cases. The true legs are movable about as much as an ordinary larva is during moulting, and they have not been as yet withdrawn from the larval shell. Whilst holding it on the palm of my hand it made very free movements of the head and thoracic segments, stretching them out, and making by the rhythmic contraction of its body a vain attempt to walk; the

five pairs of abdominal legs are now quite functionless, and the whole of the hinder end of the body not nearly so active as the anterior end. I trust I shall be able to get it to pupate and emerge as a moth.

The following is a description of the larva of this beautiful and rather rare moth, as far as can be judged by this specimen. It bears a great resemblance to *Atlas*, and I think in its earlier stage will be covered with white farina, as there are some slight indications of this in the body creases at the hinder segments. The whole body is a dull apple green, with faint darker patches or spots, exactly as found in *Cynthia* and *Atlas*. There is now no white farina, this being probably rubbed off.

The head is dull yellow as in *Cynthia*. The sides have a few small scattered pale blue flat tubercles with black centres, and there are two rows of dorsal tubercles of a beautiful shining turquoise blue, half an inch or more in length, thicker at the base and tapering to a fine point. These tubercles bear a few scattered wart-like black dots, which each emit a fine bristle. The four thoracic tubercles are twice as thick as the others, more truncated and heavily covered with black shining warts, and are like the others of turquoise blue. The two tubercles onthe third thoracic segment are more widely separated than the rest, so that they stand out of the line, a little down the sides of the larva. The anal segment is of a drake green, with a carneous spot-edged turquoise on the anal pair of legs.

It greedily drank a small drop of water, which I have often seen Saturnidæ larvæ do.

I have since had a further consignment; but the box had been opened by Postal Authorities, cocoons tipped out and tumbled back again anyhow, not packed as they were before, the lid pressed down tight, and so crushing the cocoons that there are only four out of twenty unhurt (one was entirely missing). One which was just alive was in the dormant condition of the preceding larva, but had been crushed half flat—it has now died.

Really, this wanton destruction by Postal and Customs Authorities abroad should be redressed. Some years ago I sent to North America *via* New York a corked box with a glass lid containing set specimens of rare hybrid Saturnidæ, tied with string and a label, asking the examiners to be careful with them. They cut the cord, opened the box, and *placed the cord and label in the box amongst the moths*, closed the lid and tied up the box with string *of their own*. My esteemed friend, Miss Morton, said it nearly broke her heart to see them utterly ruined.

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COLLECTING IN HUNGARY.

By Albert F. Rosa, M.D.

Whilst in Hungary during the early half of June last summer, I had the good fortune to secure a considerable number of species of butterflies quite new to the writer, including several rare and eastern species occurring in the districts visited—the neighbourhood of Budapest and at Herculesbad in the Mehadia.

At Budapest I became acquainted with Herr Abafi Aigner Lajos, who gave me a very cordial reception. I was delighted to have an opportunity of collecting with him; and he was good enough to introduce me to the Entomological Society of Budapest on one of their evenings. Herr Aigner recommended an early departure for Herculesbad, but being desirous to obtain some of the local species before going south, I remained at Budapest until the 8th, spending most of the time on that strip of what has been apparently at one time fenny ground extending from Budafok towards Kelenföld.

In these parts, the season of 1908 was more forward than usual, the weather during my stay fine, though often hazy, and butterflies here were very plentiful, and were represented, besides the special ones about to be noticed, by many common species, including *Aporia crataegi*, which was in extraordinary numbers. Nor were the good things long in showing; some large well-marked *Nomiades cyllarus* were taken at the Budafok end, and soon the splendid copper *Chrysophanus dispar* var. *rutilus* put in an appearance, and though never common, I secured a nice series of males and three females. These are of fair dimensions, measuring, males 34–45 mm., and females 41–47 mm. During my stay I only encountered three specimens of *C. thersamon*, not more than one occurring on any single day. *Apatura ilia* var. *clytie* was common flying about the willows, and occasionally alighting on the roadway, but was very wary, only a very few being netted. A couple of *Melitæa trivia* were picked up, the species being very scarce, though I must admit I expected to obtain it later elsewhere; and *Cœnonympha iphis* was on the wane, but amongst those taken a few are in good condition.

At Budapest I also got a few full-fed larvæ of *Thais polyxena*, which soon pupated, and I expect will emerge at an early date. *Pyrgus orbifer* was worn, but Herr Szlabey, one of the members of the Society, handed me a fine example he had just taken.

I moved on to Herculesbad on the 9th, and arrived in a deluge of rain, but fortunately this was the only wet day I experienced. South of Temesvár Jozsephvaros the natives of the different neighbouring States are much in evidence. The peasantry of this immediate vicinity I believe speak a Latin dialect.

Advanced as things evidently were around Budapest, it was not so apparent here; some species which it was expected would be getting worn were in fine condition. The usual hosts of more common, everywhere abundant, late June species were noticeably absent, not even one *Epinephele jurtina* or *Melanargia galatea*, probably still to come; and in the Cserna-thal at least nearly everything was more or less a novelty. The first seen was *Melitæa athalia*, often clustered in groups, common enough in itself no doubt, but amongst these some were of the fine large form *mehadiensis*. *Neptis lucilla*, in fine condition, hovering over the herbage on the banks, or at more shrubby ground soaring overhead. *N. aceris* also, not too common and sometimes worn, in similar spots or often lingering over loose stones, where a beam of sunshine finds its way down to the road. Of this scarcer species I obtained a series of eight or ten good specimens. *Thecla w-album* was flying in some numbers, just making its *debût*; and a fine brood of *Polyommatus orion* exhibiting a good range of variation, chiefly var. *ornata*, Stgr., to ab. *nigra*, Gerh., showed up at certain parts. Here also, before the road crosses the river, *Apatura iris* was generally to be noted. Two or three of *Pieris rapæ* in the, to me, unusual form *rossii*, Stefanelli (*vide* Entom. vol. xxxvii. p. 53), and *P. napi* in the var. *napææ* was not infrequent.

On the other side further down, *Chrysophanus alciphron* was taken flying at wild thyme on the hillside; the specimens, all males, being very large and beautiful, expanding about 42 mm. One or two of *Argynnis adippe* var. *cleodoxa* and plenty of *Brenthis daphne* in the freshest order.

Accompanied by a Hungarian gentleman from Karánsebes, I made a start one morning with the intention of ascending one of the neighbouring mountains, but we found collecting so good in the forest on the higher level, further advance for the nonce was deemed inadvisable. The slopes of the mountains here are very densely wooded, and for a considerable distance upwards damage worked by the larvæ of the gipsy moth was most extensive, nothing but the bare branches, from which the larvæ dangled, at the part affected mostly oak. Further up, after passing the Weisses Kreuz, the forest vegetation changes, and the ravages of the larvæ become less apparent. At this part several *Pararge hiera* were secured, as large as *P. mæra*, for which at first they were mistaken, as also one taken as a sample at Budafok, and probably others seen and passed over in the Cserna Valley, as the latter species were the same. The path descends a little before entering a ravine, leading on to the base of the Domogled peak. In this rocky ravine, especially in the forenoon, *Limenitis populi* and its var. *tremulæ* were nearly always in evidence, and often easily secured. *L. camilla* and *L. sibylla* were very common, and these I think the writer never

saw in better condition. Here also a few *Erebia ligea* and an occasional *Eugonia polychloros*. Besides these, *Neptis lucilla* was very common and in perfect condition, especially in the neighbourhood of the spring or "*quelle*" at the upper end of the ravine, and so also was *Melitæa maturna*, some of the latter being very brightly variegated, sometimes sitting together, a dozen or more, with closed wings, from amongst which number a few could be selected easily and bottled. A little beyond here a large male of *Chrysophanus virgaureæ* was netted, the only one seen. In the afternoon on the way down, below the Kreuz, though not expected for a fortnight later, *Pararge roxelana* was frequently disturbed, and fairly easily taken when resting on the bark of trees.

The following morning I ascended the Suskului, the top of which is reached about two hours from the spring. The path at first rather monotonous, penetrates upwards through the forest, where *Pararge hiera* occasionally only was noted. After about an hour there is a break and an outcrop of rock, insects become more plentiful, and on a rough grassy slope near the summit *Erebia medusa* var. *psodea* was taken in fair condition, *Parnassius mnemosyne*, large and well marked, was exceedingly common, and here also I was fortunate in securing two specimens of *Cœnonympha leander*, which species, though stated to occur in South-east Hungary, I have not noticed recorded from any particular locality. While here the sun was obscured by passing clouds for several minutes at a time, otherwise I am sure a great deal more could have been done at this particular spot. One example of what I believe was *Eugonia xanthomelas* was followed but not secured, and *Dryas pandora* occurred amongst other things on the way down. An ascent of the Domogled with a wide *detour* over the range to the west produced little of interest beyond some of those already mentioned.

Dr. Partos, one of the physicians at the Kursalon, informed me his man had seen *Libythea celtis* flying in the market; I accordingly went there several times during the forenoon on the day I was leaving and got a fine series of the species, which did not put in an appearance until between ten and eleven o'clock, after which it became very abundant, and was absolutely fresh out. The specimens taken vary little excepting in size, measuring from 39 to 49 mm. It is a very inconspicuous insect, and I recognized that I had got, as I thought, a passing glimpse of it also on the road in the Cserna-thal. Butterflies seemed indifferent to the traffic here in the market, and during the short intervals I was about I noticed more than twenty different species.

I had a card of introduction from Herr Aigner to a gentleman in Orsova, where he advised me to spend a day; but as I was anxious not to miss an expedition to Peszér which was being

arranged, and which Herr Szlabey said I should join, I did not go to Orsova. I was back in Budapest on the 15th; two members of the Entomological Society had been at Peszér prospecting the day before, and had only secured of *Melanargia iapygia* var. *suwarovius* two males. The party had therefore decided not to leave until the afternoon of the 17th, as they surmised the species was *not yet out*, and to stay two days. I regretted that I could not delay so long; but since then Herr Szlabey writes: "We visited the place, five entomologists, but none of us saw any *myrmidone* or *suwarovius*, and we returned after two days' hunting without the least hope of catching the latter species this year. I suppose for *suwarovius* it was already *too late*." I think it is quite evident that this species is not so common in this locality as formerly.

I append a list which I am afraid is not a full one, as it represents only those of which specimens were obtained and those that I distinctly remember having seen :—

Thais polyxena, Schiff.—A few larvæ, Budapest.

Parnassius mnemosyne, L.—Common on the Suskului, and occasionally in every locality at Herculesbad, including the market.

Aporia cratægi, L.—Every locality visited, especially abundant at Budafok.

Pieris rapæ, L., var. *rossii*, Stefanelli.—Cserna-thal.

P. napi, L., var. *napææ*, Esp.—Cserna-thal.

Euchloë cardamines, L.—In the ravine, Herculesbad.

Leptosia sinapis, L.—Budapest and Herculesbad, not common.

Colias edusa, Fab.—Cserna-thal, only one or two.

C. hyale, L.—Cserna-thal, not common.

Apatura iris, L.—Cserna-thal, occasionally.

A. ilia, L., var. *clytie*, Schiff.—Budafok, common.

Limenitis camilla, Schiff.—Very common at Herculesbad.

L. populi, L., et var. *tremulæ*, Esp.—Common in the ravine and in the clearings in the forest on the way up to the Domogled. Seen also in the valley and market-place, Herculesbad.

L. sibylla, L.—Also common around Herculesbad.

Neptis lucilla, Fab.—Cserna-thal and in the ravine, very common; also in the market, Herculesbad.

N. aceris, Lepech.—Cserna-thal.

Aglais urticæ, L.—Suskului, one or two.

Eugonia polychloros, L.—Always turned up in every locality at Herculesbad.

Polygonia c-album, L.—Every locality visited, especially common in the Cserna-thal.

Melitæa maturna, L.—Around Herculesbad, even in the market-place, very common.

M. phœbe, Knoch.—Budapest and Cserna-thal.

M. didyma, O.—Budapest and Cserna.

M. trivia, Schiff.—Budafok.

M. athalia, Rott., et ab. *mehadiensis*, Gerh.—Cserna Valley, very abundant.

Brenthis selene, Schiff.—Budapest; one or two only.
B. euphrosyne, L.—Suskului and Cserna, not common.
B. daphne, Schiff.—Cserna-thal, very common, and on Suskului.
Issoria lathonia, L.—Every locality visited, occasional specimens.
Argynnis aglaia, L.—Suskului and Cserna, frequent.
A. niobe, L., et var. *eris*, Meig.—Budapest, common; Suskului and Domogled, occasionally.
A. adippe, L.—Generally around Herculesbad. Var. *cleodoxa*, O. —Cserna Valley.
Dryas paphia, L.—Every locality, rather frequent.
D. pandora, Schiff.—Several on the Suskului.
Erebia medusa, Fab., var. *psodea*, Hb.—Suskului, common.
E. ligea, L.—Herculesbad, in the ravine and market-place.
Pararge egeria, L., var. *egerides*, Stgr.—Herculesbad, but nowhere common.
P. roxelana, Cr.—Herculesbad, common locally.
P. hiera, Fab.—Herculesbad, Cserna-thal, and Suskului; also Budafok. Appears to have been common.
Cœnonympha iphis, Schiff.—Budafok, rather past, but not infrequent.
C. leander, Esp.—Suskului.
C. arcania, L.—Cserna and Suskului, common locally.
C. pamphilus, L.—Budapest.
Libythea celtis, Esp.—Cserna and market, Herculesbad, very common.
Thecla w-album, Knoch.—Cserna Valley.
T. acaciæ, Fab.—Cserna-thal, one specimen.
Chrysophanus virgaureæ, L.—Herculesbad.
C. thersamon, Esp.—Budafok, three only.
C. dispar, Hw., var. *rutilus*, Wernb.—Budafok.
C. alciphron, Rott.—Cserna-thal.
Rusticus argus, L.—Budapest and Cserna.
R. argyrognomen, Brgstr.—Budapest and Suskului.
Polyommatus orion, Pall.—Cserna-thal, mostly var. *ornata*, Stgr.
P. donzelii, B.—Suskului, only one.
P. icarus, Rott., et ab. *icarinus*, Scrib.—Cserna and Budapest.
P. bellargus, Rott.—Cserna and Budapest.
Nomiades cyllarus, Rott.—Cserna and Budafok, not common.
Thymelicus thaumas, Hufn.—Every locality.
Pyrgus orbifer. Hb.—Budapest.

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THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 32.)

Another form of peculiar coloration was originally described as a separate species, viz.: *tessellata*, Stephens, 'Illustrations,' i., p. 31, pl. v., figs. 1, 2 (1828). His figure is copied from

Petiver's 'Icones' (mentioned above), pl. iii., figs. 11, 12.* This figure is in a wholly different style from Stephens' own plates, and is evidently faithfully copied, as he says, in the rough colouring of the original; the colouring must, however, have altered materially in the course of years, as there is a great discrepancy between its present appearance and Stephens' description.

Petiver's original description (without name) is: "Papilio fritillaria tessellata serotina subtus straminea," whilst Stephens' runs: "Alis supra fulvis nigro tessellatis, posticis subtus stramineis fasciis tribus flavidis lunulisque nigris." As it appears at present, the fuscous and fulvous of the up. s. are merely two shades of reddish brown (a form which I have met with more than once in nature); the un. s. f. w. has the lunules and a partial second row of spots within the outer subterminal yellow, and the rest of the wing normal in pattern and red-brown in colour; the un. s. h. w. has the outer and inner bands blackish grey, the terminal, central, and basal bands bright yellow; the light spot breaks into the basal band. Stephens' description of it runs, however, as follows: "Similar in size and shape to *M. athalia*, but evidently distinct: the wings are rather paler above: the anterior more fulvous beneath: the posterior are very dissimilar to those of the above insect (*athalia*), being entirely straw-coloured, with black nervures: at the base are three large square yellowish spots surrounded by black: an arcuated band in the middle composed of yellowish somewhat quadrate spots, which are nearly confluent and placed in a double row, and edged with black: there is then a streak of black lunules pointing outwards: then a marginal band composed of yellowish spots encircled with black, each yellow spot being (? bearing) a black lunule: the cilia are white intersected with black." This form was said by Petiver to have been fairly common in Cain Wood in his time!

There remains a named form, difficult to place with certainty, but which may possibly belong to *athalia*, viz., *veronicæ*, Dorfmeister. We first find this name in the 'Verhandlung des zoologischen-botanischen Vereins in Wien,' vol. iii., p. 136 (1853), where Dorfmeister merely says that this form is near to *dictynna*, but gives no further account of the imago, which he was evidently exhibiting and left to speak for itself. He gives a short description of the larva and pupa, and for comparison an equally short description of those of *athalia* and *parthenie*, the total outcome of which seems to be that he was quite unacquainted

* There is a reference in the 'Illustrations' to the same author's 'Catalogue' which was not published till 1829, which is somewhat puzzling. I can only conjecture that Stephens was occupied on both at once, and that the earlier part of the Catalogue was written at this time, though not published.

with *parthenie* in any stage. For over forty years there seems to have existed only the most nebulous idea of this form, but in 1896 Hormuzaki described it from two of Dorfmeister's specimens in the same magazine, vol. xlv., p. 233. (This page is wrongly quoted as 341, both in Staudinger's 'Catalogue,' and in Hormuzaki's own article in 'Iris,' xi., p. 7). Much of this description is unavailable, because it is a comparison with a specimen bred from a Regensburg larva, and supposed to be *britomartis*, but the correct designation of which does not appear with any certainty from the description. There can, however, be no question that Hormuzaki was acquainted with Dorfmeister's *veronicæ*, and there exists in the national collection at South Kensington a specimen of the latter identified by him, a female, from which the following description is made :—

Up. s. f. w.: border broad, lunules small, the third being the most prominent; outer subterminal rather broad, inner rather broader and curving outwards at inner margin; elbowed line narrow; marginal blotch outlined, and showing much of the ground colour, speckled with black scales; stigma outlined, oval, with many black scales; space between basal lines filled up with blackish; basal suffusion extends along inner margin as far as elbowed line.

Up. s. h. w.: narrow lunules of ground colour within border; darker ones, still small, within the outer line; basal suffusion extends over the rest of the wing, except a few dots within the inner line, one spot within what would, if not included in the suffusion, be the extra line, and the basal spot.

Un. s. f. w. Markings very indistinct, except the outer subterminal; inner subterminal and elbowed line indicated only by marked costal dots, the other spots which form them only slightly showing through from up. s.; marginal blotch small and square, the other markings narrow but clear; inner edging line of border angulated between the nervures.

Un. s. h. w.: inner edging line of border slightly angulated; lunules pale; outer band with palish lunules, and the inner part dark and broad; central band with the outer part not much paler than the inner, and with the third and fourth spots projecting but little; inner band darker than outer; fourth spot of basal band absent, fifth present.

This fifth spot of the basal band, is that which is spoken of by some of the German writers as the light (or white) spot at the anal angle; in his description of *veronicæ* in 'Iris' Hormuzaki states that this spot is silvery white, but it is not so in this specimen. He also speaks of the striking contrast between the colour of the marginal lunules and the darker external border, which he describes as being reddish-yellow in the male, and dark lemon in the female. This contrast certainly exists in the specimen under notice, but can hardly be called striking. In the South Kensington collection several other specimens are placed with this, whose general facies leaves no doubt as to

their belonging to the same form, but all these have the upper side darker, with broader black markings (except the inner subterminal), and with a distinctly broad black border; the outer and inner bands of the un. s. h. w. are darker, whilst the dark markings on the un. s. f. w. are slighter.

It is difficult to place this form, and it is with considerable diffidence that I have put it among the varieties of *athalia*, as it shows in several respects a somewhat close affinity with *aurelia*; and it is quite probable that when the life histories of both are carefully worked out it may prove to be a variety of *dictynnoïdes*.

(To be continued.)

FIVE WEEKS IN THE VOSGES.

By A. E. Gibbs, F.L.S.

(Continued from p. 85.)

Another pleasant excursion was made on the 10th of the same month to the Valley of the Ognon, in the department of Haute Saône, taking train to Le Thillot and driving over the col to Le Haut du Them. While the driver was baiting his horses at the hotel at the top of the pass, *Issoria lathonia* flew by, and I chased it over the departmental boundary and captured it in Haute Saône. We drove down into the valley at a spanking pace, and arrived at the station half an hour before the train was due to leave, so we decided to walk to the next stopping place. On the way we beat out our first specimen of *Arachnia levana* var. *prorsa*, but it flew across a potato patch where a dame of forbidding appearance was at work with her hoe, so we let it escape, but met with the species again among some nettles near Ternuay, to which place we took the train at a wayside station. From Ternuay we walked down the valley to Melisey. In the clover fields *Colias edusa* and *C. hyale* were flying, and another dwarf in the shape of a diminutive specimen of the former insect fell to my lot. The commonest butterfly in the valley was undoubtedly *Leptosia sinapis*, which, being just out, was in the pink of condition, and next to this graceful little Pierid in point of numbers came *Brenthis dia*, which was flying by the roadside everywhere. Near Melisey, on a strip of greensward, we made acquaintance with *Everes argiades*, of which four specimens, evidently of the second brood, came our way. I afterwards met with this insect at several places on the lower levels, but it was not until the 21st of the month that I saw it at St. Maurice which is at a higher altitude. Except for the fact that they are rather large, the specimens taken in the Vosges are quite typical. The two Chrysophanids seen during the day

were *C. alciphron* and *C. phlæas*. I again penetrated into Haute Saône on the 23rd July, when I explored the valley of the Breuchin as far as the fashionable spa of Luxeuil-les-Bains, again partly by train and partly on foot. Unfortunately, I was alone on this excursion, as Mr. Barraud had to return to England on July 13th. Crossing the mountains from Rupt-sur-Moselle, I walked down to Correvillers, taking a very fresh *Euvanessa polychloros* as I neared the village, whence I booked to Luxeuil, but a tempting bit of woodland induced me to hurriedly leave the train at a stopping-place. *Pararge megæra* was flitting in and out of the bushes on the margin of the wood, and *Colias edusa*, like a flying blossom, sailed over the more open ground. Taking a forest path which appeared to lead in the right direction I soon found myself lost in a maze of umbrageous ridings, where the thick foliage of the beeches and oaks afforded a pleasant shelter from the fierce rays of the mid-day sun, but brought no game to the bag. Emerging at length on a stretch of heath land I got my bearings and also a nice example of *Chrysophanus dorilis*, an insect with which I was to become more familiar later on. Enquiring at a woodman's cottage, I was shown a quick way to Luxeuil, and just before entering the town, in a small meadow, three more *C. dorilis* were taken in company with *Nomiades semiargus* and *Polyommatus alexis*.

The very useful map of the district published by the Syndicat d'Initiative des Vosges showed that a considerable stretch of forest land was to be found in the neighbourhood of Charmes, a small country town on the main line to Paris, between Epinal and Nancy, so I determined to visit the spot, hoping to find *Apatura ilia*, *A. iris*, and other woodland species. On the night of July 13th Mr. Barraud started for home, and we travelled together to Epinal which was as far as I could get that night. At an early hour next morning I alighted at the station at Charmes, and made for the forest, which could be seen on the west of the line. Rain had fallen heavily, making everything very wet, but an occasional gleam of sunshine awakened the hope that despite the gale which was blowing something good might be found. In an old grass-grown pit outside the forest a few *Everes argiades* and *Nomiades semiargus* were trodden up. Then *Pieris napi* and the ubiquitous *Leptosia sinapis* were met with in a forest glade where the long wet herbage made progression very uncomfortable, but I struck the railway and followed a track running between the line and the woodland, where *Cœnonympha arcania* was discovered at rest, and a batch of ova of *Bombyx rubi* was found on a leaf of wild raspberry. By the time I had reached a point where the railway crossed the high road, old Sol had temporarily gained the upper hand, and a brilliant male *A. iris* settled on some horse-droppings awakened expectations. But *iris* is a wary insect and

very difficult to approach. A gleam of purple wings and he was gone. So long as the sun shone I saw a considerable number of both the Apturids I was in search of, but they circled round the tree-tops quite out of reach, and on their occasional descents to earth were too cautious to come within reach of the net, approach one never so gently. However, after a great deal of running about in the hot sun, two *A. iris* and one *A. ilia* var. *clyte* were secured, and a pair of *Pararge achine* disturbed from the hedgerow. A worn female *Limenitis sibylla* was ovipositing on the honeysuckle, and about a dozen eggs rewarded my search, but they all proved infertile. Unfortunately, the elements were fickle and rain soon began to fall again. Shelter was found under a tree, but as there were no signs of clearing up, I reluctantly abandoned hope and made the best of my way back to Charmes, where, after a three miles walk, I found an hotel with an English-speaking landlord, a *rara avis* in these small French towns. Rain continued to descend steadily for the greater part of the afternoon, so that there was nothing to be done except sit in the cafe, where I found another weather-bound traveller engaged in entomological pursuits. He was a fisherman, and was beguiling the time catching flies which he wrapped carefully up in paper to use as bait. A few turns of my net got him as many specimens of *Musca domestica* as he wanted. Between three and four o'clock, as it cleared up a little, I determined to again try my luck. This time I took another road to the forest, only to get a few *Everes argiades*, *Cupido minima*, *Lycæna arion*, and *Leptosia sinapis*, the two former insects being found at rest on the broom, a rather curious resting habit for insects with such light and therefore conspicuous under sides to adopt, because it makes them very clearly visible from a distance, hanging from the dark green shoots of the genista. On the way to Rambervillers, where the night was spent, I noticed fine stretches of woodland, and the next morning returned a few miles along the line, but hardly had I left the train and got into the forest than a heavy shower fell, which spoiled my chances of finding many insects on the wing. Everything was so wet that I got on to the line and walked along the permanent way until I came to an inviting-looking green lane where the capture of a butterfly entirely fresh to the list in the shape of *Enodia dryas*, male, rewarded my exertions. Vain was the search for other specimens, but the morning's work resulted in the acquisition of two *Pararge achine*, two *Cœnonympha arcania*, two *Brenthis dia*, two *Everes argiades*, and single specimens of *Limenitis sibylla*, and *Thecla ilicis* var. *cerri*, with a few flies of lesser note, making a total of fourteen in all. It was not until July 29th that I was able to do any more entomological work at Charmes, but the story of that expedition may well be told here. Behind the town to the east rises a hill which is a landmark for the

whole country side. I had arrived in Charmes on the previous night, and as the morning broke dull and cloudy I resolved to see what could be found on the hillside rather than repeat my experience of a wet walk in the forest. Crossing the meadows behind the town I disturbed a few specimens of *E. argiades* and *N. semiargus*, and then making a bee-line for the top through the vineyards saw a solitary specimen of *Pyrameis cardui*, the only record I have of its occurrence in the Vosges. In some disused quarries on the crown of the hill, besides the two "blues" already mentioned, *Polyommatus corydon* and *Rusticus argus* (*ægon*) were met with. A very pretty lightly-marked example of *Abraxas grossulariata* was caught on the way home. The afternoon being a little brighter the forest was again visited, but on the road where a fortnight before *Aptura iris* and *A. ilia* were abundant, not one was now to be seen. About four o'clock, when I got into the open country again, the sun came out for an hour and sport was very good. On the clumps of wild thyme *Chrysophanus dorilis* was much in evidence, and its congener *phlæas*, fresh and bright, spread its golden wings in the sunshine. *Colias hyale* was flying freely, but *C. edusa* did not put in an appearance, though I met with it on the following morning, which I spent on the outskirts of the forest in a more northerly direction, when the Lycænids already mentioned were the chief objects of attack, a good series of *C. dorilis* being quickly obtained. Altogether my visits to the forests on the lower levels were most unfortunate, the weather being showery on each occasion, and the atmospheric conditions generally not favourable for collecting.

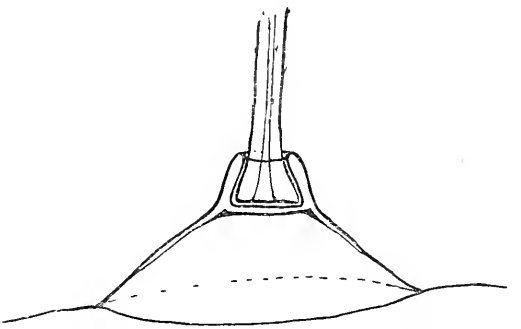
(To be continued.)

LARVA OF ARGYNNIS LAODICE.

By T. A. Chapman, M.D., F.Z.S., &c.

Mr. Frohawk's account of the life-history of *A. laodice* (*antea*, pp. 49–54, pl. ii.) is so excellent, and his plate seems to me to deserve such an overwhelming meed of praise, whether as regards accurate and scientific entomology or as a most beautiful example of the painter's art, that I hesitate to make a trifling comment thereon. I do so, however, just because it is so good, and therefore possesses, because it deserves, such great weight, that it seems desirable that weight should not be given to even a trifling inaccuracy. This affects the hairs as shown on the enlarged drawing of a segment of the first stage larva. Tubercles ii. and iii. are shown with an expanded scutcheon, and a hair, and between them a bulbous portion, no doubt that referred to in the description as a "bulbous base" of the hair. The figure, then, shows three portions—the tubercular scutcheon, the bulb, and the hair. Now, I have never

seen the young larva of *laodice*, but other Argynnids, and, in fact, all larvæ, show only two structures, the basal scutcheon and the hair. In these Argynnids the hair descends into the scutcheon, and expands a little within it, to the distance and amount of the "bulbous base."



The basal margin of the "bulbous base" is internal to the scutcheon, and may be seen through its transparent structure, but there is no structural line on the outer surface of the scutcheon such as the figures give. The other tubercles have precisely the same structure.

THE ANTIPODEAN GENUS *PROBOLOIDES*, Morl.

A Correction.

By Claude Morley, F.Z.S., F.E.S.

In the first volume of my 'British Ichneumons' I described two species under a new genus, *Proboloides*, which is certainly valid; but unfortunately there can, I am assured, be no doubt regarding the origin of the insects placed therein. They are from New Zealand, not Britain! Their right to inclusion in our fauna was certified by no less an authority than Rev. H. S. Gorham, and I, consequently, had no hesitation in bringing them forward as indigenous. I had seen no more till last month, when I discovered the same species in the National Collection. They should stand:—

Proboloides sollicitorius, Fab.—*Ichneumon sollicitorius*, Fab., Syst. Ent. 332; Spp. Ins. 425, ♂ (type in Mus. Brit.). *Ichneumon invectus*, Smith, Trans. Ent. Soc. 1876, p. 475, ♀ (type in Mus. Oxon). *Proboloides glabratus*, Morl., Ichn. Brit. i. (1903), 161, ♂ ♀ (type in Mus. Morl.).

Proboloides deceptus, Smith.—*Ichneumon deceptus*, Smith, Trans. Ent. Soc. 1876, p. 477, ♀ (type in Mus. Brit.); Cameron (in Mus. Brit.). *Proboloides maculatus*, Morl., Ichn. Brit. i. (1903), 161, ♂ ♀ (type in Mus. Morl.).

I at once wrote to Mr. Gorham respecting their origin, and

he kindly replied (*in lit.*, 15th March, 1909):—"I can say that of my own knowledge I never had any ichneumons from New Zealand or any other country in my possession. If I had taken them out of any box of foreign insects, I am sure I should have marked them so: I am very particular on such points. I should have told you if I had any doubt. My impression is that they were some I took in the New Forest; but I say this with reserve, as it is only a guess." We must, nevertheless, regard them as antipodean, and suppose they had found their way into Mr. Gorham's collection from some of the numerous boxes he so frequently receives of *Malacoderma* from all parts of the world.

NOTES AND OBSERVATIONS.

A Morning at Amelie-les-Bains, Pyrénées Orientales.—Arriving here in the afternoon of April 6th, a short walk showed that the season was not so far advanced as it usually is at Hyères at this date. The blackthorn was in full bloom, only an early bush here and there going over. Almonds apparently over, but peaches in full flower; cherries, some fully out, but many only just in bud. Here and there plums and pears in flower, some patches of lupins flowering; but for the most part things had a very bare wintry aspect; a sharp but hardly cold wind helped me to regard things as a little inclement. The snow on the Canigou was very low down. The highest point is not apparently visible from Amelie-les-Bains, and the outline is somewhat irregular; still the lofty snowy slopes dominating the landscape, whenever it formed part of it, compelled us to recognize a certain resemblance to the view of Etna from Taormina before its winter snows are melted, but the smooth conical outline of Etna gives it a majesty less obvious in the Canigou. On the 7th the weather was perfect, with little or no wind. A walk up the sunny side of the valley of the Teche showed that a good many butterflies were already on the wing. *Ægeria* was very frequent, and was the only species that was certainly going over, not one specimen in fair condition being seen. *H. megæra* was more common, females scarce, males generally but not always somewhat worn. *P. rapæ* was common, but *P. manni* was not detected. *L. argiolus* was frequent, generally worn; *L. baton* in fine condition, just coming out. Several *A. lathonia* were seen, of rather small size, one very small; several *C. edusa* were seen, but not taken; *S. cleopatra* was not very common, but afforded its welcome and brilliant contribution to the landscape not unfrequently. *P. feisthamelii* was frequently seen; a habit of assuming that *P. podalirius* was not worth catching, and in any case could be got in any numbers if required, may account for the circumstance that seeing it and catching it proved to be by no means synonymous. A single specimen of *L. celtis* was taken; no tree or plant of *Celtis australis* could be found, but one or two were afterwards found close to the hotel. *L. sinapis*, *P. daplidice*, *V. io* and *P. atalanta*, and *S. alceæ* complete the list of insects seen. No speci-

men of *Euchloë* was seen, nor was *T. ballus* met with, nor *T. cassandra*. What may appear as the season advances remains to be seen. The locality is clearly one not to be despised, though this first sampling suggests that it has neither the richness nor variety of Hyères.

A further week's stay results in a marvellous advance of vegetation being observed; trees are green instead of brown, the horse-chestnut almost in flower. One still notes the absence of any *Euchloë*, of *Thais cassandra*, and of *Thestor ballus*. No ground suitable for either of the latter has been noticed. *L. baton* is abunbant in places, *T. medesicaste* frequent, and *L. celtis* more often seen than the rarity of its food-plant would make one expect. Another notable absentee is *P. cardui*; but *V. polychloros* is almost abundant, and *io*, *atalanta*, *urticæ*, *antiopa*, and *c-album* frequently occur. *T. tages* and *C. phlæas* are frequent, and *mæra*, *machaon*, *melanops*, and *pamphilus* have put in an appearance, with *T. rubi* common in places. *L. sinapis* is now abundant, and may frequently be seen ovipositing on *Dorycnium suffruticosum*.—T. A. Chapman; April 14th, 1909.

Genitalia of the Noctuidæ.—Some expressions in the notice of Mr. Pierce's volume (Entom. April, 1909) suggest that your reviewer has overlooked the excellent work of Elwes and Edwards on the Oriental Hesperidæ, and especially the very complete examination recorded in the 'Biologia' of the appendages of the Hesperidæ of Central America.—T. A. Chapman; Betula, Reigate, April 2nd, 1909.

The Entomological Club.—A meeting was held at Wellfield, Lingards Road, Lewisham, on March 12th last. Mr. Robert Adkin in the chair. Other members present were Messrs. Donisthorpe, Hall, and Porritt, and there were several additional guests.

Honorary Members of the Entomological Club.—Prior to 1850 Honorary Members of this ancient Club are not clearly indicated, but from the beginning of that year and up to the present date, the records show that, in addition to those who afterwards passed to ordinary membership, the following were duly proposed and elected:—

1850. Mr. William Yarrell and Mr. William Wilson Saunders (Jan. 17th).
1851. Herr Dohrn (May 17th). Mr. Frederick Smith (Nov. 15th).
1852. Mr. Able Ingpen (March 20th).
Mr. Robert Warrington (May 15th).
1853. Mr. J. W. Douglas (Feb. 19th).
1859. Mr. George Lewis (Nov. 22nd).
1861. Mr. Edward Caldwell Rye (March 19th).
1862. Mr. A. R. Wallace (returned to Club card, July).
1863. Mr. H. W. Bates (reinstated Oct. 21st).
Mr. Francis Polkington Pascoe (Nov. 24th).
1866. Mr. Edward W. Janson (June 20th).
Mr. William Borrer (Oct. 17th).
1867. Mr. Joseph W. Dunning (Feb. 20th).
1871. Mr. Charles Horne (Feb. 15th).
1879. Mr. Edgar Smith (Oct. 22nd).
1891. Mr. Richard South (Dec. 11th). Appointed Hon. Sec., Nov. 24th, 1897.

1908. Mr. Alfred Sich (Jan. 14th).
Mr. Albert H. Jones (Dec. 8th).

Recent Sales of Lepidoptera at "Stevens's." — In the last issue of the 'Entomologist' (p. 101) reference was made to some varieties, which, looking at the prices they realized, were the gems of the Maddison Collection.

To deal with all the other more or less interesting aberrations would occupy more space than is available for the purpose, so reference can only be made to those that appear to be most noteworthy.

A specimen of *Papilio machaon*, with all the markings diffused, 18/–. A curious leaden-coloured specimen of *Pieris brassicæ*, 10/–. A bright buff, almost orange-coloured, *P. napi* from Donegal, 21/–. Three aberrations, put up separately, of *Euchloë cardamines* sold for 70/–, the best of the trio being a male without discal spot; this made two guineas. A queer looking specimen of *Gonepteryx rhamni*, with the right fore wing and part of left fore and hind wings male, made 55/–; and a pure white female of the same species 25/–. Eleven aberrations of *A. paphia*, offered singly, brought in £17 6s. The lowest sums given were 5/–, 10/–, 10/6, and 18/–, and the higher 32/6, 35/–, 37/6, 40/–, 45/–, 55/–, and 57/6. A var. of *A. aglaia* with suffused markings, one with large black blotches, and other examples of the species, 80/–. A dark male *A. latona*, taken by the late Mr. S. Stevens near Dover, September, 1872, made 50/–. One example of *A. euphrosyne* with very dark hind wings (Abbot's Wood, 1899), 22/–. A white var., two suffused dark specimens, and eight other examples of *A. selene*, 70/–. An aberration of *Melitæa aurinia*, fore wings black, with a row of fulvous hind marginal spots (Abbot's Wood, 1903), 95/–. Another example of *M. aurinia*, rayed under side, basal half of hind wings dark, outer light, 50/–. A specimen of *Polygonia c-album* with large black patches on all the wings, 30/–; and one with the hind wings and the outer margins and costa of fore wings very dark (Wye Valley, July, 1906), 80/–. Six *Vanessa antiopa* realized 94/–, the price per specimen ranging from 10/– to 18/–. Two exceptional varieties of *V. urticæ* made £7 15s., and four other nice aberrations of this species brought in 62/–. Four specimens of *V. io* with aberrant eye-spots sold at 15/–, 21/–, 21/–, and 40/– each.

A variety of *Pyrameis atalanta* with the band much interrupted, and a large white blotch on the fore wings (Isle of Wight, August, 1901), 40/–; whilst another specimen, a very fine under side var., much suffused on both upper and under sides, also from Isle of Wight (August, 1901), £5.

Eight nearly black varieties of *Limenitis sibylla* were put up in couples, and made 10/–, 12/–, 32/6, and 40/– per lot. A single specimen with obscure bands and red spot on fore wings sold for 35/–, and a velvety black example went for a guinea.

Two aberrations of *Satyrus semele*, one of which was a white form from Swanage, 1905, 40/–. A very pale variety of *Epinephele ianira*, cream coloured, with orange suffusion on fore wings, 22/–; one almost white (Folkestone, 1890), 42/–.

Seventeen specimens, offered singly, of *Chrysophanus dispar* realized £64 5s., the highest price per specimen being 110/–, female, and the lowest 25/–, male.

Two vars. of *C. phlæas*, one of which was the silvery form, brought two guineas; one aberration with large black spots on the fore wings, together with one pale form approaching ab. *schmidtii*, sold for 16/–; another with large spots forming band on the fore wings, 30/–. Eighteen other varieties of *C. phlæas*, comprised in five lots, made 117/–. The best varieties of *Lycæna bellargus* and *L. corydon*, offered in twos, sold at from 10/– to 35/– per lot. Gynandrous *L. icarus*, of which there were four examples, ranged from 27/6 to 40/– each; two under side aberrations of the same species, with large spots and streaks on all the wings, made 32/6 and 40/– respectively.

Ten *L. acis*, taken at Glanville's Wootton, were sold in pairs at from 10/– (under sides) to 30/–; one example of the same species, with three aberrations of *L. ægon*, made 20/–. Four gynandromorphous specimens, from Dover, of *L. ægon* ran the bidding up to 65/–.

Hesperia malvæ ab. *taras*, of which there were a dozen examples, made about 1/6 each; and a series of thirteen specimens of *Carterocephalus palæmon*, including some striking aberrations, realized 28/–.

Among the Sphingidæ, the most important items were *Hyloïcus pinastri*, of which species two Suffolk specimens sold for 8/– and 10/–. Hybrid *Smerinthus ocellatus* ♂ × *S. populi* ♀ made from 10/– to 22/– each. A dark sage-green coloured *S. populi* and a rosy aberration of the same species yielded 84/–. A gynandrous *S. populi* (right side male, left female) sold for 30/–. A red variety of *Dilina tiliæ*, with dark hind wings, 21/–, and an "hermaphrodite" of the same species, 10/–.

Of Zygænidæ there were a few good forms, the best of these being *Z. meliloti*—one yellowish pink and two confluent vars.—7/–; *Z. trifolii*, two lots, each containing one yellow aberration and one pale with confluent spots, 8/– per lot. Three lots, each comprising one yellow and one yellowish pink *Z. filipendulæ*, 16/– per lot.

Long series of Sessiidæ, about two hundred specimens in all, sold for rather less than £5.

Among numerous aberrations of *Arctia caia* (other than those previously mentioned) the most noteworthy were—one with unicolorous deep brown fore wings and jet-black hind wings, £5 10s.; one "fore wings all brown with white markings showing faintly, hind wings jet-black with inner marginal fringe pink," £3 15s.; a remarkably pale specimen with light brown and yellow markings on a cream ground, £3 10s. The best of the varieties of *A. villica* sold for 21/–, 32/6, 45/–, 65/–, and 95/– each; and a couple of aberrations, one with large apical blotch and the other with smoky hind wings, made 60/–. Eight pairs of *Lælia cænosa* realized from 8/– to 16/– per pair; two not very good males were bought for 10/–, and three poor specimens made 15/–. A pair of *Drepana harpagula* (*sicula*), from Leigh Woods, sold for 20/–; four females from the same locality made 28/–; five other examples of the same sex made only 17/–.

There were twenty-two specimens of *Cerura bicuspis*; twelve of these, from Tilgate, sold in threes at 6/– and 7/– per lot, and the others at about same rates. An odd example of *Saturnia pavonia*, with female fore wings and male hind wings, the latter with streak of the female colour, fetched 50/–. Twenty-seven examples of *Acronycta strigosa* and twenty-five *A. auricoma* averaged 2/– to 2/6 apiece. A

series of *Leucania favicolor*, including yellow, reddish ochreous, and red forms, were offered in five lots, and made £3 17s. Eight *Tapinostola concolor* (Hunts) and sixteen *Nonagria "neurica"* (Cambs), with other things, went for 23/–. A similar lot of *T. concolor*, with twelve "*neurica*," five of which were melanic (from Horning), made 37/6. Two examples of *Luperina dumerilii* (Rainham, 1895, ex Burney coll.), put up with sixty specimens of other species, were sold for 6/–. Six *Crymodes exulis* from Shetland, sold in couples, realized 97/6; and four others from Rannoch (var. *assimilis*), 63/–; two from Perthshire and one from Unst made 45/–; five others from Unst, with series of *abjecta* and *furva*, sold for 46/–.

A specimen of *Hydrilla palustris* from Wicken Fen, together with an example (ex coll. Hodgkinson), made 20/–; two others, one of which was from Cambridge, 20/–; and a pair (female, Ringwood, Hants), 16/–.

The collection of British Lepidoptera formed by Mr. C. H. Schill, and also that of Mr. A. M. Smallpiece, were sold on January 26th last. In the first-named collection there were four specimens of *Chrysophanus dispar*, one of which, a large female, made 80/–, a large male sold for five shillings less; a male (Tugwell coll.) went for 40/–, and another (Chapell coll.) 22/–. One pair of *L. cœnosa* made 30/–, and another pair 14/–. An unusually fine male specimen of *N. subrosea* realized £5. The most important items in the Smallpiece collection were:—Two aberrations of *Argynnis paphia*, reared by L. W. Newman in 1908 from New Forest ova; the male made 40/–, and the female £5. A very rubbed black ab. of *Limenitis sibylla* sold for 7/–. Four examples of *Leucania vitellina* (Kent, Devon, and Brighton), 19/–. Ten *Caradrina exigua* sold at from 1/6 to 3/– each, and eight *A. alpina* (Rannoch) 17/– the lot. Four fine *Crymodes exulis* (Shetland) made 32/6 and 28/– per couple, and eight others from the same locality, 46/–. Two Sussex specimens of *C. gnaphalii* fetched 17/–. Of varieties of *Abraxas grossulariata*, the best five brought in a total of 100/6.

We are indebted to our colleague Mr. R. Adkin for the following:—Yet another sale has been held, the collection of Lepidoptera formed by the late Mr. J. Pardoe being dispersed at Stevens's on March 23rd. The specimens were as a rule in good condition, but for the most part lacked data. The more notable lots included seventeen specimens of *Polyommatus dispar*, which sold for a total of £38 8s., the highest price obtained for single specimens being £5 for a fine female, £3 15s. for a fine male, and £3 10s. for a fine under side male, and the lowest, 16/–, for a rather poor male. A remarkably large and fine specimen of *Deiopeia pulchella*, taken by Mr. W. J. Austen at Folkestone, August 14th, 1892, brought 25/–, and two *Crymodes exulis*, taken at Rannoch, £2 5s. Less authenticated specimens brought poor prices; thus lots 1, 2, and 3, each containing among other species three specimens of *Pieris daplidice*, realized an average of 4/– per lot; eleven *Argynnis latona* brought a total of 10/–. Two lots of fifty "blues," each including four *Lycæna semiargus*, sold for 3/– per lot; while five *Deilephila euphorbiæ* failed to find a bidder until linked with three *D. livornica*, when they were knocked down for 4/–.

CAPTURES AND FIELD REPORTS.

PHIGALIA PEDARIA ab. MONACHARIA.—Ten or twelve years ago I took an example of this melanic aberration in Charnwood Forest. In 1908 I took another specimen in the same locality, which I brought home and placed in a breeding-cage, a roomy contrivance with many chinks, with a typical female that had emerged from a larva taken in the same wood. I did not notice that they paired, but subsequently I found a few eggs laid around and in the groove of a screw-head and in a joint adjacent to it. It was hardly possible to get at these, and I waited till they hatched, as a result of which some doubtless escaped; at all events I only reared some two dozen larvæ or thereabouts. The moths emerged in March last from 18th to 23rd, with the exception of a single male which appeared on Feb. 21st, after which a long spell of cold weather ensued. The sexes were in equal proportion, eleven males and eleven females. Of the males four were ab. *monacharia*, seven were typical, and there were no intermediate forms; of the females eight appeared to be more or less typical—that is, the under side was copiously sprinkled with pale grey or whitish, but the abdomen above in two examples was brownish, in six blackish. The three remaining specimens were black above, and the light grey powdering beneath was confined to the thorax and legs, the under side of the abdomen being uniformly dark grey or blackish. I was able to pair two of these dark females with black males and obtained ova, and I also paired a couple of typical males and females of the same stock. If I am successful in rearing the progeny, the results will be of some interest. This black variety or aberration of *P. pedaria* extends apparently over a considerable area in the county of Leicester. It has been taken at Knighton on the outskirts of Leicester, and, I think, also at Market Bosworth by Mr. F. Bouskell, and in Charnwood Forest, as mentioned above. An example has also been reported this year from Measham, in the extreme north-west of the county.—(Rev.) W. G. WHITTINGHAM; Knighton Vicarage, Leicester.

AMŒBE OLIVATA IN APRIL.—A newly emerged *Larentia* (*Amœbe*) *olivata* at Beaconsfield, April 18th.—C. G. DOUGHTY; 27, South Molton Street, W., April 19th, 1909.

BREPHOS PARTHENIAS AT SALLOW-BLOOM.—This pretty moth came freely to sallow-catkins in Delamere Forest, April 10th. From a solitary bush, with a net fixed to the end of a bamboo eight or ten feet long, I could have taken thirty to forty specimens in a couple of hours, possibly more. Their chief feeding-time seemed to diminish towards noon. The exceptional numbers on this occasion were doubtless due to the warm, sunny day. A *Vanessa urticæ* also paid a lengthened visit to the same bush.—J. ARKLE; Chester.

HYBERNIA MARGINARIA var. FUSCATA.—This variety occurs frequently in Leicestershire, but the proportion of the true variety, uniformly dark brownish with the markings imperceptible or nearly so, is not greater, as far as my observation goes, than five per cent. It varies in the depth of the colour. Examples, however, are much more common in which, while the markings are conspicuous, the

wings are clouded with darker patches, particularly in the hind marginal area. Last year I found a dark female, and obtained a *fuscata* male to pair. A good many of the resulting larvæ died, and I only reared eighteen examples, which emerged last March. Curiously everyone was a female; only four of these were typical. The remainder were all dark in body and wing; in three examples almost uniformly rich dark brown nearly black, but with the lines perceptibly blacker, the rest have a somewhat less dark hind marginal area. I obtained again a pairing with a wild *fuscata* male, and have, as a result, a batch of eggs.—(Rev.) W. G. WHITTINGHAM.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 3rd*, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. Francis Hamilton Lyon, of Addlestone, Surrey, was elected a Fellow of the Society.—Mr. L. B. Prout, on behalf of himself and Mr. A. Bacot, brought for exhibition a very extensive series of *Acidalia virgularia*, Hb., bred in ten successive generations from various crossings of the London and Hyères race, which had been undertaken with a view to the further study of Mendelism. The results showed non-Mendelian inheritance, there being no segregation with pure and hybrid forms in definite proportions, thus supporting Mr. Bacot's opinion that such were only to be expected in cases of hybridization of forms in which Natural Selection had virtually eliminated intermediates. A discussion followed in which Mr. Bacot, Dr. T. A. Chapman, Mr. G. Meade-Waldo, and the President took part, Mr. A. Harrison pointing out that in similar experiments conducted by himself with Mr. H. Main with British *Pieris napi* × *P.* var. *bryoniæ* from Switzerland carried through three generations, they had quite failed to obtain Mendelian proportions, but in the case of *Aplecta nebulosa* the Mendelian proportions were absolute.—Mr. H. M. Edelsten showed a living pupa of *Pieris rapæ* attached to a blade of *Clivia*, the deep green pigment assimilating closely to the coloration of the leaf.—Mr. R. Adkin exhibited what appeared to be a hybrid between *Zygæna filipendulæ* and *Z. achilleæ*, taken by Mr. A. W. Renton in the neighbourhood of Oban, N.B.—Mr. J. W. Tutt expressed his opinion that the form was an aberration of *Z. filipendulæ*, and said that in nature the two species were unknown to pair.—Mr. Hamilton H. Druce, F.L.S., F.E.S., communicated a paper "On some new and little known Hesperiidæ from Tropical West Africa."—Mr. G. A. K. Marshall, F.Z.S., read a paper entitled "Birds as a Factor in the production of Mimetic Resemblances in Butterflies." He explained that one of the chief criticisms directed against the theories of mimicry was to the effect that, on the whole, birds did not destroy butterflies to any appreciable extent; he had therefore collected together all the available evidence bearing on the question. It was contended also that the negative evidence on this subject, which appeared to have been very generally accepted, was really of very little scientific value, because in no case had it been shown that the observer had any adequate knowledge of the actual

food-habits of birds, or that any careful and exhaustive inquiry had been made into the subject. Instances were also cited to show how very easily destruction of this kind might be overlooked; while negative evidence derived from an examination of the contents of birds might be very misleading, owing to the fact that in so many instances the butterflies' wings are not swallowed, so that any recognition of the remains becomes extremely difficult. Finally, it was urged that the large body of evidence resulting from merely casual observations indicated that the assumption that birds do not eat butterflies to any extent is certainly premature, and that a fuller inquiry will probably show it to be entirely unfounded. A discussion followed in which Mr. A. W. Bacot, Mr. H. Rowland-Brown, Mr. H. Main, Mr. A. E. Tonge, Mr. H. M. Edelsten, Mr. J. W. Tutt, and other Fellows gave their experiences on the subject, Mr. W. Sharpe maintaining that the actions of the sparrow, as a domesticated bird, was not evidence for conditions which exist in the case of purely natural species. Dr. T. A. Chapman suggested that the paucity of observations on the point was largely due to the shyness of birds eating in the presence of human beings. Mr. W. J. Kaye said that he had never observed birds attacking butterflies in Tropical South America, and Commander J. J. Walker gave similar testimony with regard to the many Australasian and other oversea localities visited by him.—H. Rowland-Brown, M.A., *Hon. Secretary.*

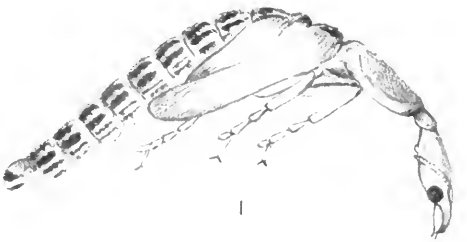
The South London Entomological and Natural History Society.—*February 11th*, 1909.—Mr. A. Sich, F.E.S., President, in chair.—Mr. Bauman, of Chingford, was elected a member.—Mr. Newman exhibited portions of the stems of *Viburnum* and pointed out the evidences showing that the larvæ of *Ægeria andreniformis* were present. They were found in a shady locality.—Mr. Tonge, stereographs of the ova of *Tiliacea citrago* in situ on lime twigs, and of *Ruralis betulæ* on sloe.—Mr. Main, a second brood specimen of *Melampias epiphron*, bred on Sept. 20th, 1908; a very light example of *Stauropus fagi* from the New Forest, and a very dark form from Epping Forest.—Dr. Hodgson, a dark, smoky specimen of *Brenthis selene* from E. Sussex, with rayed submarginal markings.—Mr. Coote, bred and captured specimens of *Calymnia pyralina*.—Mr. R. Adkin, a series of *Camptogramma fluviata* bred from Nov. 21st to Dec. 13th last, from Eastbourne.—Mr. Harrison reported that the results of the cross breeding of the forms of *Aplecta nebulosa* by Mr. Mansbridge, were *grey* × *thompsoni* = all *robsoni* and *robsoni* × *grey* = fifty per cent. each of these forms. A long and interesting discussion took place as to the oviposition and early life of the lava of the Ægeriids. It was noted that in the first instar the larvæ of several species were hairy and presumably external feeders.

February 25th, 1909.—The President in the chair.—Mr. Stone, of Clapham, was elected a member.—Dr. Hodgson exhibited a series of *Nemoria viridata* taken in 1906–8 in Lancashire and Surrey, and commented on the forms shown, including ab. *concavilinea*. He also showed a third brood specimen of *Celastrina argiolus* in which the blue was almost wholly replaced by dull grey.—Mr. West (of Greenwich), a cabinet drawer of Coleoptera, the first of the rearrangement of the Society's Collection.—Mr. Main, for Mr. Baldock, a yellow

variety of *Euchelia jacobææ* from Norfolk, and three fine specimens of the rare *Papilio mechowianus* from Central Africa.—Mr. McArthur, specimens of *Anarta cordigera* from Rannoch, and read notes on its habits and habitat.—Mr. H. Moore, a gynandrous example of *Papilio clearchus* (?) from S. America, right side male, left side female.—Mr. Newman, *Aglais urticæ* var. *ichnusa* with sagittate blue spots on the hind margin, *Dryas paphia* with much raised black markings, "black" *Limenitis sibylla*, a straw-coloured variety of *Rumicia phlæas*, the unique pale grey form of *Smerinthus ocellatus* bred by him in 1902, and several *Nisoniades tages* var. *taras*.—Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society.—*February 2nd*, 1909. —Mr. H. M. Edelsten exhibited a series of *Cœnobia rufa* from various localities, including vars. *lineola*, *pallescens*, and *fusca*, and photographs (by Mr. Main) of anal processes in female used to deposit the ova in the central pith of rushes.—Mr. W. J. Kaye, *Noctua glareosa* taken at sugar in Richmond Park, in Sept. 1907, also specimens from Sandown, Aberdeen, and Shetlands; those from the latter locality were very dark, save for one example intermediate between dark and light forms. — Mr. H. Leach, *Phlogophora meticulosa* taken at Rickmansworth, freshly emerged on Dec. 11th. — Mr. L. A. E. Sabine, *Dianthœcia conspersa* bred from Bude larvæ. — Mr. A. J. Willsdon, three broods of *Tephrosia biundularia* reared in 1906. Three pupæ of the third brood went over to 1907, and the resulting imagines differed in appearance from the bulk of the brood, having the lines on wings more continuous and more clearly defined, being, in fact, more like the first (spring) brood.— S. J. Bell, *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, Feb. 15th, 1909.—Mr. C. E. Stott, Vice-President, in the chair.—Mr. Charles E. Raven, Mr. Albert Harrison, F.C.S., F.E.S., and Mr. Hugh Main, B.Sc., F.E.S., were elected members of the Society. — Mr. George Arnold, F.E.S.. gave a lecture entitled "Hymenoptera." After outlining the classification of the order Mr. Arnold passed to the Aculeates proper, the group Vespoidea, Konow, and gave instances from the life-histories of *Chrysis ignita*, *C. osmiæ*, and *C. viridula*. The lecturer then dealt with the ants, emphasizing the following points:— (1.) Division of labour, *e. g. Aphœnogaster*, soldiers, workers-major, workers-minor, &c. (2.) Slave-making (dulosis) and probable origin of same, *e. g. Formica sanguinea*, *Polyergus rufescens*, and *Anergates atrabulus*. (3.) Parthenogenesis, the cytological explanation of the process. (4.) Myrmecophilous animals, *e. g.* Aphids. The following genera of the Fossores were described and the chief features in the life-cycle noted, *viz. Ammophila*, *Sphex*, *Ampulex*, *Bembex*, *Philanthus*, and *Crabro*. In the Diploptera, wasps, the life-history of *Odynerus*, and the peculiar tube-building to the entrance of the burrows in *O. spinipes*, were very fully discussed. The lecturer concluded with a review of the Anthophila, with remarks on the parasitic Anthophila, such as *Sphecodes*, *Nomada*, *Stelis*, and *Psithyrus*. Mr. Arnold exhibited a small collection of types to illustrate his lecture. A discussion ensued, in which nearly all the members present took part.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*



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W. J. Lucas photo. & del. West, Newman proc.

RAPHIDIA MACULICOLLIS.

1. Pupa (× 10). 2. Imago, ♀ (nat. size).
3. Imago ♀ of *R. notata*, for comparison (nat. size).
4. Mandibles, &c., of Pupa (× about 16).
5. Tip of right fore wing (magnified).

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RAPHIDIA MACULICOLLIS.

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

(PLATE IV.)

ON April 9th last Mr. G. T. Lyle and myself found near Rinefield in the New Forest a living pupa evidently belonging to one of the species of *Raphidia* (Snakefly). It was discovered in a piece of a branch about three inches in diameter lying on the ground, and in a decaying condition though not in an advanced state of decay. The very lively pupa had its limbs and other appendages free, and nothing could be seen in the nature of a cocoon. It was about one centimeter in length and the wing-cases were about three millimeters long. In colour it was generally pale yellowish, except that the abdomen was covered dorsally with large brown spots symmetrically arranged, that the eyes were very dark, and that the jaws were brownish.

By April 25th the pupa had become much darker than it was when found, at any rate on the dorsal aspect and especially anteriorly. It was kept in a small glass-topped box amongst loose bits of decaying wood, and was taken to Kingston when I returned on April 27th. Resting as it did on its side, in the semicircular position depicted on Fig. 1, it looked a peculiarly helpless object. In the evening of April 29th I found it had crawled up the side of the box and so was using its legs in the manner customary with insects, and therefore presented the dorsal aspect upwards.

By the morning of April 30th the imago had appeared and the pupal skin remained attached to the side of the box. It had probably but lately emerged as it seemed to be rather teneral and its colour became darker during the day. Towards evening it was noticed to be running about the box in a very lively way. A gnat (apparently *Chironomus dorsalis*) was introduced into the box, but the snakefly appeared to be afraid of it, though the gnat was at length seized and the *Raphidia* appeared to be eating it. The gnat was, however, soon set free, and was only partly

crippled. If the fact that the pupa when found was much lighter than it afterwards became shews that it had but lately changed from the larval state, then the pupal condition would seem to last about three weeks. Possibly, however, premature exposure may have caused the darkening.

Soon the snakefly was killed, as otherwise it is difficult to identify the species. It was then found to be a male of *Raphidia maculicollis*. Of the genus *Raphidia* there are four British species, *R. notata* (Fig. 3) being considerably larger than the other three —*R. maculicollis* (Fig. 2), *R. xanthostigma* and *R. cognata*— which are of about the same size. They belong to the natural order Neuroptera, in its restricted as well as in its wider sense.

In the Oxshott and Esher Common districts of Surrey this species appears to be fairly plentiful. I have met with it there as early as May 18th in 1901, whilst the latest date I have is June 14th in 1906. In the Wisley district I met with one on May 23rd, 1899. Mr. E. C. Goulton gave me a female taken near Lyndhurst in the New Forest in 1906, and Mr. D. Sharp gave me a Scotch specimen which he took at Nethy Bridge in July, 1908. Mr. M'Lachlan had received a specimen from Haslemere and another from Morayshire. So the species seems to be rather widely distributed. On May 20th, 1903, Mr. G. T. Porritt and myself took, chiefly by beating, about twenty-eight individuals in some two hours at the Black Pond, Esher Common. Most, if not all, had lately emerged, and had glossy wings shewing their teneral condition. One was found on a tree-trunk near its empty pupa-skin, which I then met with for the first time. The wings of the recently disclosed imago were yellowish and clouded, like those of a freshly emerged dragonfly; the joints of the body were pale brown, the rest of the insect being dark. One of the snakeflies taken that day and placed in a box with some *Hemerobius humuli* (judging by the results found afterwards) attacked two of the latter, killing them, and eating part of their body.

In *R. maculicollis* the wing-veining near the pterostigma seems sufficiently constant for purposes of identification. Attention should be paid to those cells containing a cross (Fig. 5). The *single* cell attached to the distal extremity of the pterostigma seems to be constant in this one of the four British species and peculiar to it.

It should be noted that the pupa is able to work its jaws, though it has no cocoon to cut open.

Explanation of Plate.

1. Pupa of *R. maculicollis* in resting position on its side (× 10). 2. Imago (female) of *R. maculicollis* (nat. size). 3. Imago (female), for comparison, of *R. notata* (nat. size). 4. Jaws of pupa of *R maculicollis* (× 16), for comparison with those of ant-lions and Chrysopas, belonging to the same natural order. 5. Tip of right fore wing of *R. maculicollis* (magnified).

ON THE ICHNEUMONIDÆ OF THE BANKSIAN COLLECTION IN THE BRITISH MUSEUM.

By Claude Morley, F.Z.S., F.E.S., &c.

Fabricius's connection with Sir Joseph Banks is obscure, but it is probable they became acquainted at the time that the former was working upon insects at the British Museum. This was previous to 1775, for many Banksian specimens were brought forward by him, including all the Australian ones, in 'Systema Entomologiæ' of that date. In these notes, however, I have had before me his 'Species Insectorum,' published at Hamburg and Kiel in 1781, and the numbers preceding each species refer to that work (pp. 420–442), since all were not enumerated at the earlier date, and such as were there instanced are again referred to at the later.

Besides these, the collection contains only the types of the three species given by Nils S. Swederus in his paper "Fortsåttning af Beskrifningen på 50 nya Species af Insecter" (Sv. Ak. Handl. 1787, pp. 279–281).

The following list comprises all the specimens in the Banksian Collection in their order as placed, which has been preserved as at first received by the Museum authorities. The Collection was presented by the Linnean Society in 1863, and to those specimens especially referred to as typical, in the 'Museum Register of Zoological Accessions,' I have here suffixed an asterisk.† From the same source comes the information that "the following type specimens were not in the Collection when it was presented to the British Museum. . . . *Ichneumon melioratorius*, Otaheite; *Cryptus nutatorius*, New Holland; *C. fuscator*, Sandwich Isles; *Pimpla barbator*; and *Ophion luteus*, New Zealand."

It may be well to mention that the Antipodean insects were taken by Sir Joseph Banks while on his memorable voyage round the world with Captain Cook; most of them when the latter was stranded at Endeavour River, where Cooktown now stands, in 1770, and where he had to remain for repairs for four months. A copy of Cook's own sketch of the spot of beaching is in the library there.

MS. Generic Label:—ICHNEUMON.

1. sugillatorius.—2. *Cœlichneumon sugillatorius*, Linn. One female with immaculate post-petiole, and one male with neither head nor front legs.

† *Ichneumon oculator*, there indicated as such from "England," is not now represented in the collection, though said by Fabricius (Spp. Ins. No. 80) to have been in "Mus. Dom. Banks"; nor do I find the equally indigenous representatives of *Ophion latrator* and *O. saltator*.

12. molitorius.—1. *Protichneumon laminatorius*, Fab., ♂.
11. saturatorius.—2: (1) *Stenichneumon trilineatus*, Gmel., ♀.
(2) *Melanichneumon perscrutator*, Wesm., ♀.
29. fossorius.—1. *Amblyteles subsericans*, Grav., ♀.
37. comitator.—2: (1) *Cœlichneumon comitator*, Linn., ♀.
(2) *Stenichneumon culpator*, Schr., ♂.

["negatorius, Sw. MSS."*—1. *Cratichneumon fabricator*, Fab., ♂.]

2. raptorius.—1. *Amblyteles neglectorius*, Fab., ♀.
3. sarcitorius.—2: (1) ? *Amblyteles cerinthius*, Grav., ♀.
(2) *Ichneumon extensorius*, Linn., ♀.

7. nutatorius.—1. A representative of the Mesostenini, ♀. This exactly corresponds with Frederick Smith's description and figure of *Mesostenus albopictus* (Trans. Ent. Soc. 1876, p. 477, pl. iv. fig. 1) from New Zealand, and later recorded thence by Cameron; the latter specimen, though not Smith's type, is in the British Museum. The only distinction—a very strong one—is in the terebral length, which is not less than that of the abdomen. I consider it probable that *M. albopictus*, Smith (Proc. Linn. Soc. iii. (1859), p. 172), from Key, is distinct. I cannot find Fabricius's species in either the British Museum Collection or in Mr. Roland Turner's extensive collection of Hymenoptera, in which are some twenty distinct species of *Mesostenus* (*sensu lato*) from Northern Queensland. Not a *Cryptus*, as placed by Dalla Torre.

9. infractorius.—1. *Amblyteles infractorius*, Panz.
10. ambulatorius.*—1. *Amblyteles vadatorius*, Illig., ♀.
27. fusorius, var. β pisorius.—1. *Protichneumon erythrogaster*, Steph., ♀.
15. luctatorius.*—1 (only). *Ichneumon extensorius*, Linn., ♀.
16. lotatorius.*—1. A typical-looking black female *Ichneumon* (*sensu* Thoms., though it has more the facies and obtuse anus of *Amblyteles*); respecting colour, it is only necessary to add that the "thorace maculato" consists of a single callosity beneath the radices, that the apical angles of the third abdominal segment are also red, with the whole legs, except coxæ, trochanters, and extreme apices of hind femora, concolorous. It is a stout insect of 12 mm. in length. Undoubtedly Fitch is correct (Proc. Ent. Soc. 1883, p. xxxvi.) in synonymising *Priocnemis pascoei*, Kirby (Trans. Ent. Soc. 1883, p. 200, not p. 20, as given in 'Zoological Record' *et* D. T.), with this species. I, like him, have compared the types, and find the variability he refers to mainly in the immaculate scutellum and radical callosities of *I. pascoei*, which also has the flagellum pale beneath; but its sculpture throughout is entirely identical. The seven other specimens referred to by him include a couple of the undermentioned male, which differs little, except in also having the

third abdominal segment pale. All are from New Zealand. *Colobacis forticornis*, Cam. (Trans. New Zealand Institute, 1901, xxxiii. p. 110) is entirely synonymous with the above, and is erroneously placed by its author in the Amblypygini on the shape —not structure—of the abdomen. *Colobacis* cannot be differentiated from *Ichneumon*, Thoms.

["Tinctorius, Sw. MSS."—A large *Ichneumon* (s. s.) or *Amblyteles*, with the abdomen coated with ?dirt.]

19. vaginatorius. — 1. *Banchus* sp., ♀ (probably *B. pictus*, Fab., with the scutellar spine mutilated). "Scutello albo" = apical half only; "thorace maculato" = two round dots on metanotum and the same on front of mesonotum, and linear callosities beneath radices; third abdominal fascia is not "interrupta."

21. bidentorius.—1. *Amblyteles armatorius*, Forst., ♂.

20. annulatorius.*—1. *Amblyteles palliatorius*, Grav., ♂. I am not quite sure of this determination, since the head and front legs are missing, and the four first segments are alone basally black, but I have no doubt respecting the genus (*cf.* Ichn. Brit. iii. 45).

["Punctatorius, Sw. MSS."—*Amblyteles oratorius*, Fab., ♂.]

32. sollicitorius.*—This male ichneumon is not, as I had at first sight expected, the male of *I. lotatorius* (*ante*, No. 16), but of the somewhat closely allied *I. invectus*, Smith (Trans. Ent. Soc. 1876, p. 475), as the sculpture of the metanotum at once proclaims. Consequently both Fabrician titles stand, with, as its author originally suspected, and I have little doubt is the case, *I. insidiator*, Smith (*l. c.* p. 476, nec Tischb.) as male of *I. lotatorius*. There is a small series of both sexes in the General Collection in British Museum. Hutton (Cat. New Zeal. Dipt. 1881, p. 120) is the only author who has mentioned *I. sollicitorius* since 1824.

["Ferrugator, Act. Holm. 1787, p. 280." — Two females, marked with a type-label, as though they had passed from Swederus, who first described the species (*loc. cit.* viii. pl. iv. fig. 2), through the hands of Fabricius to the Banksian cabinet. Both sexes of this species, which I am inclined to regard as a *Melanichneumon* on account of its hexagonal areola, were redescribed by Cresson (Trans. Amer. Ent. Soc. 1877, p. 208). It is entirely distinct from *Ichneumon ferrugator*, Kirby, Fauna Bor.-Amer. iv. (1837), p. 258, the type of which does not appear to be in the British Museum.†]

† I am not aware that *Cryptocentrum lineolatum*, Kirby, has been mentioned in literature since the erection of both genus and species in the above work in 1837 (pl. vi. fig. 1). I have discovered the type of this species in the General Collection of the British Museum, where are three others of which two are labelled "Georgia," and the third, received in 1844, from Albany River, Hudson's Bay, bears the MS. name "*Pimpla Annulata.*" That they are typical representatives of the genus *Rhyssa* there can be no

61. rutilator.—1. A female *Cryptus* (*sensu* Thoms.), and probably nothing but *C. obscurus*, Grav. At all events, it has nothing whatever in common with *Tryphon rutilator*, L.

38. vigilator.*—1. It superficially resembles and is possibly congeneric with *Automalus alboguttatus*, Grav., though very distinct in many particulars; it is not, as I at first anticipated, *Catadelphus nigrocyaneus*, Tosquinet, Ichn. d'Afrique (Mém. Soc. Belg. 1896, p. 103). "Africa æquinoctiali" probably refers to the Gold Coast.

68. elongator.*—Two males, *Alomyia debellator*, Fab.

73. lineator.—1. *Cœlichneumon lineator*, Fab., ♂.

["an Ichn. Luctatorius, Fab., Sp. No. 15."—This would appear to represent the "Zelandicus puncto albo sub alis, vix tamen distinctius," but I suspect some error here, for the single specimen under this label is a typical female of *Trogus exaltatorius*, Panz. In any case, it is extremely improbable that any Ichneumonid (s.s.) has its "Habitat in Europa, in noua Zelandia"; though at least one Tryphonid—*Bassus lætatorius*—is known to do so.]

67. delusor.—2: (1) *Lissonota ? vicina*, Holmgr., ♀.
(2) *Phygadeuon* (s.s.) sp., ♀.

26. lætatorius.—2. Both *Bassus lætatorius*, Fab., ♀ ♀.

["Novatorius, Sw. MSS."—This specimen is an *Ichneumon* (*sensu* Thoms.).]

35. reluctator.—1. *Cœlichneumon lineator*, Fab., var. *fereus*, Gr., form *rufescens*, Berth., ♀.

41. debellator.—1. *Alomyia debellator*, Fab., ♀.

[*Cœlichneumon cyaniventris*, Wesm., ♂, placed after No. 41, is very roughly labelled "vix a sugillatorio distinctus."]

MS. Generic Label:—CRYPTUS.

25. dubitorius.*—A large female Braconid: "Habitat in noua Hollandia."

34. decoratorius.* — This is not a *Cryptus*, as placed by Stutton (Cat. New Zeal. Dipt. 1881, p. 123) and Fabricius in 1804, for the type is a female, and has no mesopleural sulci. It is certainly referable to the genus *Platylabus*, and is allied in coloration to *P. rufus*, Wesm. The only, and entirely, black fourth segment recalls the similar band of *Pezomachus fasciatus*, Fab. "Ultimo segmento fascia atra" is a very loose phrase.

40. caudator.*—A female *Lissonota* (or possibly *Syzeuctus*,

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doubt, though the areolet—as described by Kirby—is entirely wanting in one specimen. I have seen thence no female, to which sex the original specimen was erroneously referred, but have little hesitation in entirely synonymising it with *R. persuasoria*, Linn., which is hardly of rarer occurrence in America than in Europe.

for I cannot see the spiracles), with the terebra longer than the abdomen. "Habitat in noua Hollandia."

44. profligator.—2. Both females of *Glyphicnemis profligator*, Fab., as set forth in my Ichn. Brit. ii. 63–66; both have the frons distinctly and not confluently punctate, the antennæ centrally clear white, and the size not large. They are in capital preservation.

75. maculator.—1. A large male *Pimpla* (*Itoplectis*) *scanica*, Grav., which has recently been synonymised with *Ichneumon maculator* (*cf.* Ichn. Brit. iii. 103). Curiously enough, it is of the (? more usually Oriental) form, not uncommon in India, having the hind tibiæ with no black markings.

128. Acarorum.—1. *Myrmosa melanocephala*, Fab. E. S. 1793. "Habitat in Europæ borealis Curculionum laruis"!

MS. Generic Label:—BASSUS.

82. prærogator.—2: (1) A Tryphonid, but not *Tryphon* (*Dyspetes*) *prærogator*, Grav.; the areolet is entirely wanting.
(2) A black *Limnerium*.

["Ichn. Agrestorius, Gmelin, p. 2679, n. 341."—1. ♀: "Habitat in Insula Otaheiti. Mus. Dom. Banks." This is the type of Swederus's species (Sv. Ak. Handl. 1787, p. 279); it has not been mentioned in literature since 1790, and is allowed to remain in its original genus by Dalla Torre in 1902. In the Banksian Collection it is placed in *Bassus* (as understood by Fabricius, nec Fallén); but the type differs from Holmgren's Pimplid genus *Echthromorpha* solely in lacking the apical alar infumescence. It is congeneric with both *Pimpla variegata*, Brullé, and *Chrysopimpla ornatipes*, Cam. An analogous specimen was captured by Dr. Coppinger in the same island during "The Voyage of H.M.S. Alert" in August, 1880.]

36. objugator.*—1. "Habitat in Africa æquinoctiali." This female is quite certainly synonymous with *Osprynchotus heros*, Schlett. (Ann. Soc. Belg. 1891, p. 33), as set forth by Tosquinet (Ichn. d'Afrique, 248). It is recorded from Togoland, the Cameroons, Senegal, Sierra Leone, and the Congo; from the last locality Miss E. M. Sharpe presented five Hymenoptera to the British Museum in 1890, of which one female belongs to the present species, thus fixing its locality.

MS. Generic Label:—PIMPLA.

62. manifestator.—2. Both are *Ephialtes mesocentrus*, Grav., females; the second has lost its head. Stigma fulvous; hind tibiæ not shorter than their tarsi.

66. irritator.—1. This North American female was correctly relegated in 1846 to the genus *Ephialtes* by Brullé, whose short

description (Hist. Ins. Hym. iv. 81) is accurate as far as it goes. The economy of this species is outlined by F. H. Chittenden ('Insect Life,' v. (1893), p. 247; *cf.* iii. p. 461). It is said to be ektoparasitic upon larvæ of the Longicorn beetle, *Leiopus variegatus*, Hald. No male has yet been assigned to it; the female, as is usual in the genus, is probably much the commoner sex.

104. punctatus.*—1 ♂; "Habitat in Coromandel." This is quite certainly the *Pimpla ceylonica* of Peter Cameron (Manch. Mém. 1899, p. 165), for I have compared the types *inter se* and find them to agree *ad amussim*. The latter author is incorrect in supposing Krieger's description of *Xanthopimpla punctata* (Ber. Nat. Ges. Leipzig, 1899, p. 101) to appertain to a distinct species. The fault lies entirely in the Fabrician diagnosis.

74. extensor.—1. *Glypta sculpturata*, Grav., ♀. Fabricius refers the species to Linnæus and Geoffroy, but it is impossible to read any meaning into the old descriptions, such as Fourcroy (Ent. Paris. 1785, p. 423), Schrank (Fauna Boica, 1802, p. 270), Walckenaer (Fauna Paris. 1802, p. 60), or Latreille (Hist. Crust. et Ins. 1805, p. 180; *cf.* Grav. Ichn. Europ. 1829, iii. pp. 980–1). And the name has hitherto been, and still should continue to be, applied to *Ephialtes extensor*, Tasch. (Zeits. Ges. Nat. 1863, p. 255), which I have recently been enabled to add to the British fauna through the kindness of E. A. Cockayne, Esq., who took it in Kensington Gardens in 1908 (*cf.* also Marsham, Trans. Linn. Soc. 1797, p. 23).

77. strobilellæ (labelled "Ichn. strobionellæ ? Fabr. Sp. Ins. No. 77").—This is a typical *Lissonota cylindrator*, Vill., ♀; by no means representing its description, which is simply copied from Linnæus (Syst. Nat. ii. p. 935). "Habitat in Larva Phalænæ Strobilellæ & Turionellæ."

["Ichn. Fuscator, Sw. MSS. Ex Ins. Sandwich."—An entirely black, red-legged *Ephialtes*, differing in no appreciable way from *E. extensor*, Tasch. I suspect some unfortunate transposition has here taken place, for Fabricius describes this species in his 'Piezata' of 1804, p. 85, under the name *Cryptus fuscator*, as having only the front pair of legs red, with a black mark before the apices of the wings, both of which points diverge from this specimen.]

65. compunctor.—1. A large female *Pimpla* (*Apechtis*) *brassicariæ*, Poda.

MS. Generic Label:—OPHION.

96. luteus.—2 ♀ ♀: (1) *Ophion luteus*, Linn.
(2) *Paniscus ? testaceus*, Grav.

100. Morio.*—1 ♀. "Habitat in America boreali." This is a rather broken specimen, and was correctly placed in his genus *Thyreodon* by Brullé in 1846. It is quite common throughout Northern and Central America; specimens in British Museum

are from Massachusetts, New York, New Hampshire; Orisaba, Jalapa, and elsewhere in Mexico. Strangely enough, it is not included in 'Biologia Centrali-Americana,' i. (1883–1900), p. 288, although in the representative collection of that work are two females bearing (Mr. Champion tells me certainly) the MS. label, "*peronatus*, Cameron," who perhaps had some doubt respecting its priority! This label I have destroyed.

101. amictus.* — A single headless female of *Schizoloma amicta*, Fab.

102. glaucopterus.—A fine female *Opheltes glaucopterus*, Linn.

88. falcator.—This is certainly the same species as "*Banchus falcator*," Piez. 128, and not distinct, as given by Dalla Torre (Cat. iii. 64 et 142). It is neither a *Banchus* nor *Campoplex*, as its entire lack of areolet at once testifies. My knowledge of the Ophioninæ is not sufficient to enable me to name the single female in the collection, and I can but superficially describe it as a medium-sized *Anomalon* with the hind tarsi not spatuliform; the abdomen, with the exception of the second segment discally, is centrally red, and both thorax and scutellum are entirely black. It cannot, I think, be the *I. falcator* of Ent. Syst.

MS. Generic Label:—BRACON.

47, *Ichn. fastidiator**; 49, *I. proficiscator**; 50, *I. hospitator*; 51, *I. denunciator**; 53, *I. defensor**; 56, *I. capitator**; 46, *I. desertor*; 55, *I. insidiator**; 57, *I. mutator**; and "*Ichn. Assimilator*, Nov. Act. Holm. 1787, p. 280," of Swederus; are all Braconids, and do not fall within the scope of this paper.

ACROLITA CONSEQUANA, H.-S., IN DEVON, WITH STRAY NOTES ON ITS HABITS, &c.

By Eustace R. Bankes, M.A., F.E.S., &c.

With reference to Mr. C. Granville Clutterbuck's note (*antea*, p. 100) chronicling the discovery in South Devon, in July, 1907, of larvæ of *Acrolita consequana*, from which seven imagines were bred in the following month, it may be of interest to record the fact that I took this species in South Devon as long ago as August 13th, 1900. The moth being abundant throughout my visit, which terminated early in September, a nice series was secured, and either it or the larva has proved equally common in the other years in which the same locality has been explored. I also bred it in plenty, July 1st—August 27th, 1902, from larvæ of all sizes collected there in the latter half of September, 1901, and have distributed some of these Devonshire specimens, with full data, among various friends.

The species has been recorded as double-brooded in Hants (Vict. Hist. Hamps. 147) as well as in Dorset (Prac. Hints, ii. 84), with reference to which counties Meyrick (H. B. Brit. Lep. 505) enters the first brood as appearing in May, and the second in July and August. The moths reared by Mr. Clutterbuck from South Devon on August 6th obviously belonged to at least a second brood, since the larvæ that produced them were found feeding in July, and the fact that my imagines of the first brood, bred from the same coast, only emerged in July and August was doubtless due to the larvæ and pupæ being kept in a very cool place. I have taken the perfect insect on many dates in September, and having then noted it as common at the same time that larvæ of all sizes were abundant, think it not unlikely that there is, throughout the summer and early autumn, a constant succession of broods, with much overlapping, and no marked intervals between them. In any case, the probability of the occurrence of, at any rate, a third brood in South Devon is suggested by my having met with the imago in some numbers, and in fine condition, on September 24th—26th, and having captured in sugar, in 1906, a good example of the female as late as October 15th.

The moth has frequently shown itself to be possessed of "a sweet tooth" by visiting this bait at some distance from its haunts, generally only in odd individuals, but more or less commonly at times. When the weather conditions are favourable it flies freely during the evening—not only "at dusk," as stated by Wilkinson (Brit. Tort. 187 (1859))—but is very difficult to net, its protective colour and rapid dashing flight preventing the eye from following it against the background of sand and shingle in which its food-plant grows.

In my experience, the larva, when feeding in the autumn, gradually constructs, as a rule, a well protected gallery, of remarkable length, up the exterior of the stem of the shoot, by joining together with silk the leaves that grow thereon and drawing them in towards the stem; it works its way upward by degrees, and, as it progresses, eats out the contents of the indrawn leaves, whose bleached appearance then attracts instant attention to the situation of the larval gallery. It has often been observed devouring the seeds, but I do not happen to have found it feeding in this manner. *A. consequana* hybernates as a full-fed larva, spun up in an opaque dirty-ochreous cocoon formed of tough silk, and normally pupates therein in the spring, though some of my larvæ cannot well have done so before July. In confinement, certain individuals spun their cocoons among the pieces of the plant, whilst others fixed them against the bottom or sides of the cotton bag in which they were imprisoned; they seemed particularly fond of attaching to the outside of the cocoon any minute pebbles that could be

found, and from this it is reasonable to assume that, in nature, the cocoons are spun amongst, and coated with, the coarse sand that surrounds the food-plant. This is *Euphorbia paralias* in South Devon, to which district my acquaintance with the insect is limited, and also in Hayling Island, as we learn from Wilkinson (*l. c.*), but in the Isle of Portland *E. portlandica* has been proven to be the chosen plant.

The examination of a large number of bred imagines shows that the females average somewhat smaller, and rather paler, than the males. My largest examples of the former expand 16 mm., while those of the latter measure 14 mm., and in smaller specimens there is about the same proportional difference in size between the sexes. The smallest individual known to me is one of my bred Devonshire males that has an expanse of only just 10 mm. From the numerous observations that I made with regard to the hour of emergence, one learns that seventy-two per cent. of the moths left the pupa between 6.30 a.m. and 1 p.m., the rest showing no special predilection for any one period of either day or night over another.

Norden, Corfe Castle: April 10th, 1909.

TORTRICES NEAR LIVERPOOL IN 1907–8.

By W. Mansbridge, F.E.S.

About twenty species of the Tortricina, not met with in our localities by myself previously, have been captured or bred in the last two years.

Tortrix cratægana from Knowsley and Simonswood; the former being a yellow form. I also saw this moth in some numbers at Delamere Forest, but it was worn at the end of July when it was found. *T. unifasciana* is generally darker from the mosses than from Wallasey. An addition to the local lists is *T. cinnamomeana*. This moth was quite common in 1907 on Kirkby Moss, and last year a single specimen was netted in Delamere Forest. *T. corylana* seems generally distributed, but only odd specimens have fallen to my share at St. Helens, Simonswood, and Delamere Forest. I met with *T. viburnana* in some numbers at Whitegate Heath, males only, the first week in July. *T. forsterana*.—This is another moth that seems to be darker at Simonswood than at Wallasey or near Leeds. The beautiful and very common little moth *Peronea variegana* is everywhere found on the whitethorn hedges. The South Lancashire forms seem to be confined to vars. *borana*, *cirrana*, *asperana* and type, with var. *albana* rarely; some of the *cirrana* forms are a very lovely dark blackish purple. I have not taken the extreme form at Wallasey. In April, 1907, I found a pair of

hybernated *P. hastiana* in copula at Formby. This is mentioned because I believe the spring habits of this extremely abundant species are little understood. Personally I have never found it after hybernation except on this occasion. A nice series of *Teras contaminana* var. *dimidiana* was bred from larvæ found at Crosley when arranging for our summer field-meeting. Nearly all were extremely dark, though of this form. *Dictyopteryx forskalcana* has been found in some numbers at Wallasey by Mr. C. B. Williams among sycamore, and I took a specimen at Kirkby last August. When at Crosby last June, I found a number of larvæ on iris and ranunculus; these turned out to be *Tortrix costana*, a large and handsome species. *Penthina variegana* has shown up in odd specimens from various localities, and if worked for would be found commonly. *P. dimidiana* I have only found at Simonswood occasionally; in 1907 I bred two or three from larvæ beaten from birch the previous autumn. *Antithesia aceriana*, one specimen at Sefton Park in 1907. *Sericoris bifasciana*, also one specimen from Delamere, July, 1908. *Cnephasia musculana*, one from Delamere, May, 1907. *Sciaphila pascuana*, although not noted previous to 1907, has since occurred at Delamere and Simonswood, not uncommonly. *Clepsis rusticana* was new to my collection when I captured a few specimens at Kirkby Moss in pine or among sweet gale. In a clump of rushes, only about a square yard altogether, on Kirkby Moss, *Bactra lanceolana* was quite common in August, 1908, and a few rather dark specimens were taken at Hatchmere last July, where it is no doubt common. A specimen of *Phoxopteryx lundana* came to light at Sefton Park in August 1907, and *P. mitterpacheriana* occurred at Delamere, in May, 1907. The imago was found sitting on birch leaves.

When looking for *C. flavicornis* at Simonswood in April, 1907, and also at Delamere the same year, I gathered all the distorted catkins from the birches that I could find; later these produced a fine series of *Graphiolitha ramella* type and var. *costana* in about equal proportions, though perhaps in the Delamere series the type slightly outnumbered the variety. A nice series of *G. nævana* was bred from holly tips collected near Liverpool in 1908, and a few *G. geminana* from *Vaccinium* found at Delamere; on the same ground in July this species was abundant, flying freely when disturbed in the daytime.

Among the pines at Simonswood in 1907 I found a moth that at first seemed familiar, but at the time I could not recognize it; on comparison at home, however, it turned out to be a very dusky form of the male of *Batodes angustiorana*; it was so dark as to suggest the possibility of a black form parallel to the var. *fuscana* of *T. podana*. The locality is likely, and a black form is one that might reasonably be expected to occur, hence I shall look out for it every season if I can get there at the proper

time. *Pædisca bilunaria* occurs at Kirkby Moss in fair numbers; the series taken last year is considerably darker than my southern set from Wimbledon Common. *P. solandriana*, always abundant among birch, occurred in its usual numbers. I generally get the scarcer forms best by breeding from Delamere larvæ. *Heusimene fimbriana* was a very pleasing capture in April, 1907, when I got a single specimen at Delamere; subsequent search for it at the same place has been unsuccessful. At the same time and locality *Coccyx argyrana* was abundant on the oaks.

Perhaps the red-letter record among the Tortrices for 1908 was the capture of a beautiful specimen of *Stigmonota pygmæana*; it was beaten from spruce fir in Delamere Forest, one very cold day in April.

At Wallasey, in July, *Dicrorampha petiverella* was common, and a few *D. politana* also occurred, both flying swifty in the hot sunshine. At the same time I was pleased to find that the efforts of the golfers have not quite exterminated the very local *Rhodaria sanguinalis*, very close work producing three fair examples. *D. saturnana* is represented by one specimen from a garden wall near Sefton Park, Liverpool; probably some tansy was growing in the garden on the other side. *Eupœcilia nana* occurred at Knowsley and at Simonswood Moss in fair numbers; *E. maculosana*, one specimen, at Knowsley in 1907. A second brood of *E. dubitana* was noted at Crosby sandhills in September, 1907, and at the same time *Catoptria expallidana*, which must have been a second brood, was abundant.

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ON THE NEUROPTEROUS GENUS *RAPHIDIA*, Linn.

By Claude Morley, F.E.S., F.Z.S.

One so rarely meets with mention of this genus in periodical literature, and Mr. Lucas tells me that so little is known respecting it that it may not be out of place to offer a few remarks from my own experience, very scanty though it be. These insects are remarkable for the peculiar elongation of the prothorax into a snake-like neck bearing a narrow and vicious-looking head, and when handled they pose the latter in a terrific ophidian manner, as was noted by Kirby and Spence (Introd. 7th ed. 6), while De Geer says they then eject a drop of brown and fetid liquid from their "proboscis" (Mém. ii. 734), though his allusion is more probably to the allied genus *Panorpa*. The genus consists of very few species, all of which are confined to the Palæarctic region; in Britain we have but four, which

may still be differentiated by the characters given by Dr. Hagen (Ent. Ann. 1858, p. 30), though his *R. londinensis*, Steph. is now considered a mere variety of *R. xanthostigma*, whose subradial nervures are often irregular; in fact, I possess a specimen exhibiting the characters of both forms in its alternate wings.

R. xanthostigma, Schum.—I have captured but four examples of this species, which I consider distinctly rare. Two females are from a dry and sandy part of Brandon in Suffolk, and were taken on 10th and 11th June, 1899; the one beaten from the branch of a dead and large oak-tree, and the other found beneath dead and rotten oak-bark, along with such subcortical beetles as *Hypophlœus bicolor* and *Thanasimus formicarius*. The other pair, on the contrary, occurred in an extremely wet part of Tuddenham Fen, some twelve miles distant, on 6th June, 1903, when a male was beaten from a large live sallow-tree, and 19th June, 1901, when I detected a female settled on the leaf of a well-grown water-dock; I remember that it took to flight as I approached it through the ooze.

R. cognata, Rbr.—This is evidently extremely rare. The only example of which I have heard was captured in Foxley Wood, Norfolk, in June, 1886, by my friend Mr. H. J. Thouless, and is in the collection of McLachlan, who had not seen a specimen less than sixty years old (*cf.* E.M.M. 1900, p. 263).

R. maculicollis, Steph.—Apparently confined to the New Forest, where it is by no means uncommon. I beat a female from hawthorn blossom at Brockenhurst, 26th May, 1895 (E.M.M. 1895, p. 193), and on the previous day took another with aberrant neuration at Holmsley Marsh. In the middle of June, 1907, I found both sexes sparingly at Wilverley Inclosure, Matley Bog, and Denny Wood, though in nothing like the profusion stated at E.M.M. 1894, p. 189.

R. notata, Fab.—Our last indigenous species is the only one with any claims to frequency or general distribution; it probably occurs in all the ancient-timbered districts southerly from the Midlands. In the New Forest it has occurred to me on live oak-trees, sitting on bracken, and lying dead upon water at Brockenhurst, Lyndhurst and Wilverley, in May, 1895 and June, 1907. In Suffolk I have beaten the female from birch in Assington Thicks, on 21st May, 1899, and from bushes in the Bentley Woods on 15th June, 1895. But though I constantly worked the latter locality from 1893 to 1904, I saw no more imagines. On 20th July, 1900, the head, &c., of a larva were detected beneath the bark of comparatively new pine railings there.

Concerning the life-history of this species, Mr. G. T. Lyle has recently (Entom. 1908, p. 233) described the eggs from the New Forest; they are probably laid in the crevices of bark. Respecting the larva, I quote from my diary of 5th November,

1900: "Found a larva of *Raphidia sp.* in burrows in holly, a solid old stem with the bark not very firmly affixed. This larva was quite healthy and lively on 5th March, 1901. It had just become a nymph in no enveloping case on 20th April, 1901. It appeared to attain greater degrees of activity the nearer it approached maturity. On May 4th it was able to hold on to a piece of wood with its pupal legs, move its abdomen and head freely in a vertical direction. On May 6th a female *R. notata* emerged; it had just evacuated its nymph skin at 10 a.m. and the wings were already of normal length, but the wings, legs, ovipositor, antennæ, clypeus, and cibaria were quite pellucid-white, the abdomen and thorax were red, the head and two apical tarsal joints being the only black parts. The insect took till 4 p.m. to attain perfection, and did not move a fraction of an inch the whole time; the day was normally warm, damp and dull. The nymph itself had crawled to a horizontal position in its box, where, however, it was not very firmly attached, as on the box being jarred it fell to the bottom. The larva had gnawed a narrow and shallow ridge in the very hard holly-wood enclosed with it during the winter."

Waterhouse says (Trans. Ent. Soc. i.) that the larva of this genus lives *in* the bark, and Westwood suggests that this was because they were preparing a retreat for their pupation, believing them from the oral structure to be predacious. McLachlan says (E.M.M. 1894, p. 186) that they are found *in* dead wood and *under* bark; he kept one larva: "it is fed occasionally with a fly, and seems to thrive; I suspect it feeds at night, for I have never been able to detect it in the act"; nor does he say that the flies were actually devoured. At all events my larva had nothing but a ligneous diet from November to May!

A further examination of the larva-skin reveals that the nymph probably emerged from the castaneous, hard and chitinous prothorax, which is split longitudinally throughout its disc, as also is the basal portion of the similarly conformed head as far as the region occupied in the imago by the ocelli; the dull white larval abdomen appears to have been shuffled off and in no way fractured; it is now strongly curled ventrally. Its mandibles have the apex much more elongate and acuminate than is figured by Westwood (Mod. Class. ii. 56, Fig. lxvi. 9), with the inner basal tooth much more prominent and subrectangular. The cast nymph-skin, carded when soft, is transparent, flavescent, and 12 mm. in length; all the members, including the antennæ and remarkably short recurved terebra, are perfectly free, and the hind legs are in no way impeded by the wings, which in the nymph measure 5 mm., and in the imago, which emerged from it, 13 mm. in length.

A NEW BEE OF THE GENUS *MEGACHILE* FROM AFRICA.

By T. D. A. Cockerell.

Megachile ekuivella, n. sp.

♀. Length about 9 mm.; black, with a short broad heart-shaped abdomen; face broad, eyes prominent, converging below; sides of face, cheeks, and base of mandibles with copious snow-white hair (that on face varying in some specimens to yellowish); vertex with fuscous hair; mandibles with three evident teeth, but the fourth or inner one obsolete; clypeus densely punctured, but with a median rather elevated smooth shining band; front very densely rugoso-punctate; antennæ black; mesothorax and scutellum as densely punctured as is possible, dullish, with short hair, mixed dark fuscous and pale ochreous, the latter predominating; sides and under part of thorax, and femora, with white hair; hair on inner side of tarsi orange: hind basitarsus broadened and flattened; claws with a basal tooth; tegulæ dark fuscous in the middle, hyaline and reddish on the margin; wings dusky, nervures black; abdomen with entire orange-fulvous hair bands on the apical margins of the segments; last dorsal segment with black bristles; ventral scopa bright orange-fulvous, white basally, black on last segment.

With the females comes a male, assumed to be conspecific:—

♂. Hair of head and thorax above mixed black and white, not ochreous; hair-bands of abdomen white, with coarse black hair on the discs between them; antennæ slender, black; wings strongly dusky; anterior tarsi simple; anterior coxæ without spines; claws cleft, the inner tooth the smaller; carina of sixth abdominal segment jagged, with little truncate spines or teeth, three or four on each side, the median interval rounded, but not especially large; no subapical spines or teeth beneath.

Hab. Hinterland of Benguella, January 3rd, 1908, female type (Wellman); Ekuiva Valley, five females, one male; two of the females at flowers of Compositæ (Wellman).

This little species is related to *M. caricina*, Ckll., but is smaller, and easily distinguished in the female by the mainly pale ochreous hair of the scutellum (that of *caricina* being coarse and black) and the orange-fulvous abdominal hair-bands. The male differs conspicuously in the jagged carina of sixth abdominal segment. *M. venusta*, Smith, judging by the description, seems to have many points of resemblance, but the abdominal bands are white in *venusta*, and the scopa is not black apically. Even closer resemblance may be found in *M. cordata*, Smith, from Natal, but Smith makes no mention of any black or fuscous hair on the dorsal surface.

NOTE ON *EVETRIA (RETINIA) BUOLIANA*, Schiff., AND *E. PINICOLANA*, Dbld.

By Eustace R. Bankes, M.A., F.E.S., &c.

In the Editorial review [Entom. xli. 255–256 (1908)] of Mr. A. J. Gillanders' 'Forest Entomology' we read, on p. 256, "The species represented on p. 269, fig. 256, is certainly *Retinia buoliana*, but moths bred from larvæ feeding in the leading shoots of Scots pine, as illustrated (fig. 255), are usually *R. pinicolana* . . . . " This latter assertion is perhaps true of certain districts, but it would be interesting to learn what evidence can be adduced in support of it as a general statement. At different times I have collected, in various localities in East Dorset and West Hants, large numbers of *Evetria* larvæ feeding in the leading shoots of Scots pine, precisely as shown in the illustration (fig. 255) in question, and have reared scores of imagines from them, every one of which, with the exception of a single *pinicolana* bred from among some Ringwood larvæ, has been referable to *buoliana*. Wherever plantations of Scots pine are found in this part of the country, *buoliana* seems to be either common or abundant, whereas *pinicolana* is so exceedingly local that a spot in the Isle of Purbeck, where I discovered it in 1901, is still its only known Dorset habitat except for one which has yielded a solitary individual. Moreover, even where the two species occur together, *buoliana* is, in my experience, *by far* the more plentiful, and this is the case in all districts about which I have definite information, though it will be sufficient to quote from only the three authors first to hand. In the course of his valuable notes on "The Tortrices of Surrey, Kent, and Sussex," the late Mr. Walter P. Weston wrote in Entom. xiii. 160 (1880), "*Retinia buoliana*, Schiff.—Common among various kinds of firs. . . . . It occurs throughout these counties. *Retinia pinicolana*, Dbld.—Of similar habits to the preceding species, but much scarcer. . . . . It has occurred at Tunbridge Wells, Dartford; Hastings, Uckfield, Tilgate Forest; Croydon, West Wickham." In the catalogue of Lepidoptera published in the 'Victoria History of Hampshire,' the notices of these species were from the pen of Mr. W. H. B. Fletcher, and run as follows: "*Retinia buoliana*. Abundant in plantations of young Scotch firs in New Forest. *Retinia pinicolana*. Less common by far than the preceding in New Forest." Again, Mr. A. Thurnall, in his "List of Tortrices taken in South Essex between 1885 and 1901," published in Entom. xxxv. (1902), sums up his experience as follows, on p. 191: "*Retinia buoliana*, Schiff.—Very common wherever *Pinus sylvestris* grows, ... *R. pinicolana*, Doubl.—Much rarer than the last species; singly

in Wanstead Park, Warley, and Blackmore at rest on *P. sylvestris*."

Seeing that both species feed in exactly the same way, and that *E. buoliana*, as both Mr. Fletcher and I have learned to our disappointment, is certainly no less fond than its close ally of the leading shoots of the Scots pine, and is infinitely more numerous than it in each of the six English counties mentioned above, one is certainly justified in asking for some proof of the accuracy of the reviewer's statement.

Norden, Corfe Castle: April 14th, 1909.

DESCRIPTIONS OF TWO NEW SPECIES OF *MUTILLA* FROM KUCHING, BORNEO.

By P. Cameron.

Mutilla annexa, sp. nov.

Black, the basal two abdominal segments and the basal fourth of the third, red; the head and thorax densely covered with white pubescence, the metanotum being also covered with a white depressed pile; the base of abdomen sparsely covered with white hair; the apex of the second, third, and middle of fourth fringed with longish white hair; the sides of the third and the apices of the following segments thickly fringed with stiff black hair. Wings almost hyaline, the nervures black; the first abscissa of radius straight, obliquely sloped, about one-fourth longer than the second, which is a little shorter than the third; the first transverse cubital nervure rounded, oblique; the second broadly rounded outwardly; the first transverse cubital nervure is received very shortly before the middle of the cellule. Tegulæ black on the inner side, the outer (and larger) part rufo-testaceous. Keel on basal ventral segment straight. Pygidium rather strongly and closely punctured. ♂. Length, 9 mm.

Kuching, Borneo (John Hewitt, B.A.).

Vertex on either side of the ocellar region finely, closely, obliquely striated; the ocellar region smooth, raised; bordered by a narrow furrow. Front sparsely punctured; a smooth, shallow furrow down the lower half. Antennal scape furrowed below, the sides of the furrow keeled. The basal two joints of the flagellum are not much longer than the third united. Occiput broadly rounded. Pro- and mesothorax strongly, but not very closely punctured; the scutellum is more coarsely rugosely punctured. Metanotum reticulated; the basal area has the apical half narrowed, about half the length of the basal part; the bordering keels are more or less curved.

Allied to *M. attila*, Cam.; the latter is a larger species, has the wings distinctly dark fuscous, the tegulæ black, the basal abscissa of the radius is curved, not straight, the first recur-

rent nervure is received beyond the middle of the cellule, and the area on the base of metanotum is almost of equal width throughout.

Mutilla devia, sp. nov.

Black; the head, thorax (the pronotum and the mesopleuræ densely), the apices of the abdominal segments and the legs covered with longish white pubescence; the wings hyaline, the nervures black; the first abscissa of the radius straight, sharply oblique, about one-fourth shorter than the following two united, the second about one-fourth longer than the third; the first recurrent nervure is received in the middle of the cellule. Tegulæ dark testaceous at the base, the apex white; they are covered with white pubescence. Keel on basal ventral abdominal segment distinctly dilated at the apex. ♂. Length, 7 mm.

Kuching, Borneo (John Hewitt, B.A.).

Vertex on either side of the ocellar region finely, closely, longitudinally striated, sparsely covered with longish black hair; the front densely covered with silvery pubescence. Pronotum closely, the mesonotum less closely, but more strongly punctured; there are two distinct furrows near the centre of the apical half of the mesonotum. Scutellum more closely, rugosely punctured than the mesonotum. The space bordering the scutellums and the base of the metanotum densely covered with depressed silvery pubescence. There is no clearly defined area on the base of the metanotum unless it is hidden by the dense pubescence; the metanotum is rather coarsely reticulated. Calcaria white. Third antennal joint about one-quarter longer than the fourth.

THREE NEW ANTHOPHORID BEES FROM TEXAS.

By T. D. A. Cockerell.

Tetralonia argyrophila, sp. nov.

♂. Length about 13½ mm., black, with the hair on the head, thorax, and basal segment of abdomen (covering the latter densely) ochreous, rather bright on the thorax above. Clypeus bright lemon-yellow, the yellow angularly incised laterally; labrum cream-colour with a narrow black edge; mandibles without any yellow spot; antennæ very long, entirely black; third joint very short, its shorter (anterior side) about as long as its apical breadth antero-posteriorly; mesothorax dull, densely punctured; area of metathorax rugose; legs with pale hair, that on inner side of basitarsi light orange; middle tarsi not distorted; hind spur of hind tibiæ normal; abdomen beyond the first segment shining black with sparse black hair, but with scattered long silvery-white hairs, becoming numerous toward the apex, and forming a sort of thin fringe on the sides of segments four to six; apical margin of sixth and sides of seventh with short light hair. In my table in Trans. Amer. Ent. Soc. 1906, this runs to 4 on p. 79, and does not precisely fall in either category there indicated. On the whole

it runs nearest to *T. edwardsii* (Cresson), to which it has a very strong superficial resemblance, differing, however, by the black hair on the basal part of the second abdominal segment (although that segment has some light hair subapically), the brilliant silvery hairs on the apical part of the abdomen, and the shorter third antennal joint. The last two characters also separate it from *T. acerba* (Cresson). There is no light band on the fifth segment, such as is seen in *T. edwardsii vagabunda*, Ckll. In some respects *T. argyrophila* closely resembles *T. fedoris*, Ckll., from the same region, but the apical part of the abdomen is very different, and the wings have none of the dusky yellowish tint of *fedoris*.

Hab. Lee County, Texas, March 24th (Birkmann, No. 16).

Melissodes masuca, sp. nov.

♂. Length about 11½ mm., black, with ochreous pubescence, becoming bright yellowish red on the thorax above. No black hair on head or thorax. Head rather broad; eyes dark reddish; clypeus (except the two black spots), labrum, and large spots on base of mandibles yellow; antennæ long, flagellum black above, clear ferruginous below; third joint broader than long; mesothorax with strong punctures; tegulæ clear ferruginous; wings dusky, nervures rather dilute brown; legs ordinary, apex of middle and most of hind tibiæ ferruginous; abdomen with continuous bands; hind margin of first segment rather narrowly whitish hyaline, of the others broadly and suffusedly dark reddish brown; segments two to five with broad basal bands of ochreous tomentum; second with also an entire straight median band; sixth segment with black hair; seventh with lateral red teeth. In the table in Trans. Amer. Ent. Soc., 1906, this runs to 8 on p. 81; it also runs to that vicinity (*i.e.* of *M. aurigenia* and *agilis*) in Robertson's table in Trans. Amer. Ent. Soc., 1905. It differs from *M. trinodis*, Rob., by the yellow on mandibles and other characters; from *M. agilis* and various other species it is readily known by the entire narrow median band (separated from the basal one by a black exposed area) on the second segment. In colour and general appearance (except for the much longer antennæ) it is curiously like an undersized *M. suffusa*, Cress., but the distribution of hair on the second abdominal segment and other characters are entirely different.

Hab. Fedor, Texas, June 17th, 1901 (Birkmann, No. 17). The name means golden-haired in a dialect of Ceram.

Melissodes loena, sp. n.

♂. Length about 12 mm.; hair of thorax, &c., ochreous, but not quite so bright as in *M. masuca*; clypeus (except the spots), labrum, and large spot on mandibles yellow; flagellum black above, clear ferruginous beneath; tegulæ shining ferruginous; nervures fuscous. In the characters of the head, thorax, &c., this is almost the same as *M. masuca*; were the abdomen removed, it would be hard to separate them. The maxillary blade is shorter in *loena*, the tegulæ are shining (dull in *masuca*), and the hind tibia is more slender, less densely

covered with hair, and red only at the apex. The venation is distinctly darker. The abdomen is conspicuously different, being narrower, with the hair-bands white. The hind margins of the segments are more transparent, so that the basal hair-bands can be seen through them. The first segment is very strongly punctured. From *M. kallstrœmiæ phenacoides*, Ckll., this is readily known by the greyish-red (instead of green) eyes, the dark venation, the shorter tongue, the much less hairy hind tibia, and the white hair-band on segment five.

Hab. Lee County, Texas, November, 1908 (Birkmann, No. 15). The name *loena* is derived from a Malay word referring to flowers.

Boulder: April 1st, 1909.

THE *ATHALIA* GROUP OF THE GENUS *MELITÆA*.

By Rev. George Wheeler, M.A., F.E.S.

(Continued from p. 115.)

We must now pass to the named forms of other species than *athalia*, though it may be well to note in passing that Aurivillius in the 'Nordens Fjärilar' treats both *aurelia* and *parthenie* (called by him *parthenie* and *parthenoides* respectively) as varieties of *athalia*, on the ground of their mutual resemblance and specific variability. It is possible that this use of the name *parthenie* for *aurelia* elsewhere may account for the apparent confusion between the two species in many German authors, a confusion so great as often to leave one in doubt as to how many of the latter really know *parthenie* at all, a doubt which more rarely assails one when dealing with French or Swiss writers.

Deione var. *berisalensis* has already been somewhat fully dealt with, and the resemblance between the Swiss and the southern Spanish forms touched upon. I have, in fact, specimens from South Spain which I should certainly have supposed to come from Martigny, though they are perhaps slightly lighter in ground colour and the *x*-mark is not so defined as is usual in the more northern specimens. To my mind this resemblance appeals as a further confirmation of the specific identity of the two forms, and should they ever be proved to be distinct, the Southern Spanish race will have to be united with *berisalensis* and not with *deione*. It should perhaps be noted that Freyer's *deione* ('Neüere Beiträge,' vi. p. 21, pl. 493, fig. 1, 1852) is merely a small specimen of *parthenie*, which accounts for his unwillingness to allow it specific rank, as he was evidently unacquainted with the real insect.

There appear to be three named forms of *parthenie*, viz.: *aphœa* (Freyer *nec* Hübner), which has already been described (*antea*, p. 57), *jordisi*, Rühl, and *beata*, Caradja.

Var. *jordisi* is described at great length by Rühl in the 'Palaearktischen Grossschmetterlinge,' p. 413 (1893); the description is, in fact, so long that it is impossible to quote it *in extenso* in the original German, and we must content ourselves with a somewhat condensed paraphrase, thrown for the sake of convenience into the same form as the descriptions of the species and varieties previously given.

Up. s.: Ground colour much brighter red with strongly marked black nervures somewhat invaded in the central part of the f. w. by the ground colour; f. w.: border broad and of a deep black, all other markings wanting except a trace of the (?) inner subterminal on the inner margin, the outlines of the stigma and the basal lines, these giving the appearance of three spots of the ground colour surrounded with black. The up. s. of the female is lighter, with a light apical spot within the border, and the black nervures are nowhere overspread with the ground colour. (This light apical spot is here called by Rühl "characteristic of *parthenie*," but I have already, vol. xli. p. 223, quoted him as agreeing with me that it is sometimes present in other species, nor is it always to be found in *parthenie* female.)

Up. s. h. w.: border very broad and black including outer line; basal suffusion reaching to inner line, this leaving only one row of spots of the ground colour; basal spot small.

Un. s. f. w.: a broad black streak along the inner margin; only one of the usual lines (? the elbowed line) is present, and consists of clear black spots and streaks. In one female the black streak along the inner margin is nearly obsolete, and nearly all the spots of the elbowed line are radiate; there is also part of a row of yellow lunules along the outer margin, edged internally with black.

Un. s. h. w.: the usual banded arrangement nearly absent, the basal portion being red, the outer portion lemon-yellow, the two being separated by a bowed and indented black line; there are also four basal black spots; the inner edging line of the border is absent as in *asteria*, the outer being blacker and more sharply defined than usual; the black edging of the lunules of the terminal band is less arched but blacker than in the type; the outer band represented by a row of bright red spots partly round and partly triangular. In the female the inner edging line of the border shows in a rudimentary condition, the lunular part of the border being more distinct than in the male; the red spots of the outer band are reduced to centres surrounded by pale orange-red; the black basal spots very large and the dividing black line broader than in the male.

It will be seen that this form of *parthenie* corresponds with the *corythalia* form of *athalia*, but with the un. s. f. w. of *eos*, and it might well have been doubted whether it were not in fact this species, but variants of this form of *parthenie* are figured by Oberthür in the 'Bulletin de la Société Entomologique Française' for 1900, pp. 276–277, and if there is one author whose distinctions between *athalia* and *parthenie* are absolutely to be trusted it is Oberthür, as is shown by his paper in the 'Entomo-

logist's Record', vol. xv. p. 313. The original specimens from which Rühl's description was made came from Frankfort-on-Maine; it is also reported by Rondou from the Pyrenees, but he makes no mention of the underside. His description is as follows: "Fond des supérieures d'un rouge vif, sans la rangée mediane de taches noires; bord externe largement noir; inférieures d'un noir à peu près uniforme sauf la bande marginale."* This it will be seen hardly corresponds to Rühl's description, except with regard to the up. s. h. w., and it may well be doubted whether the form is really the same.

Var. *beata* is described by Caradja, 'Iris' vol. vi., p. 181 (1894), as follows: "In den Thälern der Pyrenäen bei Luchon, Sost, St. Béat, fliegt *parthenie* in einer sehr grossen, meist hellen Form, meine Stücke von dort messen im Durchschnitt 39 mm. (das grösste ♀ fast 41 mm.). Vielllicht verdient diese grosse lichte Lokalform mit einem Namen bezeichnet zu werden, als welche ich var. *beata* vorschlage."† Specimens in the British Museum collection from Vernet seem to be Caradja's *beata*, but there are others from Central France belonging to Sand's collection and very erroneously marked '*aurelia*,' which correspond completely with the above description.

[The name *polynome* is attached to certain specimens of *parthenie* in Schaufuss's collection which come from south-western Europe. This name I have traced to Schneider ('Systematishe Beschreibung,' p. 213), who refers it to Pillers und Mitterbachers 'Reisen', pl. v. figs. 1, 2; this figure purports to be *maturna* which it certainly is not; so far as I can judge I should imagine it to have been taken from a specimen of *phœbe* with unicolorous ground, such as are found on the south side of the Alps, *e.g.* at Iselle or at Reazzino. It is certainly not *parthenie*.]

Varia, having been generally regarded as a variety of *parthenie*, has not directly given rise to any named forms. It seems, however, probable that Aurivillius' var. *norvegica*, 'Nordens Fjärilar,' p. 29 (1888), which is of course given by him as a variety of *athalia*, since he disregards all these specific differences, and which is referred by Staudinger to *aurelia*, should really be referred here; it is called *varia* by Lampa ('Tidskrift,' vi. p. 18, 1889), and it is erroneously suggested in the 'Entomologist's Record,' vol. xiii. p. 346, that on grounds of priority Lampa's name should stand, but the priority is with Aurivillius' name. If, however, I am right in my opinion that

* Ground colour of the f. w. of a bright red, the central row of black spots wanting, outer border broadly black; h. w. of an almost uniform black except the marginal band.

† In the valleys of the Pyrenees at Luchon, Sost, St. Béat, *parthenie* flies in a very large, mostly light form; my specimens from this locality measure 39 mm. across; the largest female almost 41 mm. Perhaps this large light local race ought to be distinguished by a name, for which I propose var. *beata*.

varia is quite distinct from *parthenie*, the correct designation of this form would be "*varia*, Bisch., var. *norvegica*, Auriv."

Britomartis having been already disposed of as certainly, and *dictynnoïdes* as probably, a distinct species, and *veronicæ* having been provisionally considered under *athalia*, we are left with the unsatisfactory var. *rhætica* to treat as a variety of *aurelia*. It is thus described by Frey ('Lepidopteren der Schweiz.' p. 30 (1880)): "Kleiner, lebhafter rothbraun weniger trüb, mit feineren schwarzen Zeichnungen, das ♀ nicht selten mit schr lichten braunen Fleckreihen."* I speak of it as unsatisfactory, because the distinctions are so slight that it is difficult to separate it; specimens from the Rhone Valley, from Wiesbaden, and from Czernowitz, are scarcely distinguishable apart. The name should perhaps be reserved for the light Engadine specimens which were in the mind of the author, though these again can hardly be distinguished from the light females which occasionally appear among the Visp and Sion examples. The name is frequently, and wrongly, applied in Switzerland to smallish dark specimens.

Dictynna, though a very variable species, has not given rise to many varietal names. I have found but two: var. *vernetensis*, Oberthür, and ab. *seminigra*, Muschamp. After long searching I have been unable to find any reference to the former in Oberthür's published works, and can only trace it back to Rondou's 'Lepidoptères des Pyrénées,' p. 24 (1903), where the name is ascribed to Oberthür and the following description given: "Une race constante et très différente du type. Elle est beaucoup plus claire que dans les Hautes-Pyrénées, où elle ne diffère point de celles de la France centrale. Le dessus des quatre ailes est à peine plus obcsur que chez *athalia*; aux inférieures la couleur fauve domine."† This is a very distinct form, showing much more of the ground colour than one meets with elsewhere, but it is still quite obviously *dictynna* even on the upper side; when placed by the side of Reazzino *britomartis* it rather serves to emphasize the specific distinctions of the latter.

Ab. *seminigra*, Muschamp, is shortly described as follows in the 'Bulletin de la Société lépidoptérologique de Genève,' i. p. 70 (1905): "alis posterioribus nigris uno eodemque modo." The original specimens were taken on the Campolungo Pass, but it is by no means confined to this locality. I have specimens from various parts of Switzerland.

* Smaller, lighter red-brown, less dull, with narrower black markings, the female not rarely with very light brown rows of spots.

† A constant race and very different from the type. It is much lighter than in the Hautes-Pyrénées, where it is in no way different from those of Central France. The up. s. of both wings is scarcely darker than in *athalia*, on the h. w. the fulvous colour is predominant.

(To be continued.)

FIVE WEEKS IN THE VOSGES.

By A. E. Gibbs, F.L.S.

(Concluded from p. 118.)

The remainder of the holiday, which, on the whole, was in pleasing contrast meteorologically to the forest experiences, was spent at St. Maurice, every possible moment being devoted to entomology. During my absence one of my little girls had been working hard with her net, and had found out for herself the best way to catch *Euvanessa antiopa*. Near a farmhouse on the Ballon de Servance a cherry-tree grew beside the path, and at its foot was a runnel of water. *Antiopa* loves cherry juice, and quite a number of these fine insects could sometimes be seen feeding at the same time, descending occasionally to the water to drink, when they would fall an easy prey to the watchful hunter. Towards the end of our stay *Papilio machaon* began to get common. Soon after our arrival at St. Maurice, some larvæ were brought me which had been found feeding on the carrot foliage in the garden at the hotel, one of the pupæ being taken home to England by Mr. Barraud, who secured admirable photographs of it and the freshly emerged imago, and his pictures were hung at the annual exhibition of the Royal Photographic Society. Some beautiful specimens of *Apatura iris* were taken, chiefly in the mornings, sunning themselves on the branches of the hornbeams. Behind the cotton mill at the entrance to the Vallée de la Presle was a small thicket by the side of the stream, which was a favourite haunt of the regal butterfly, while on a clump of thistles close by *Dryas paphia* was almost sure to be found enthroned. Our last climb was to the summit of the Rouge Gazon, and was chiefly memorable for the abundance of fine dark females of *Argynnis niobe* var. *eris*, which were flying in the meadows above the forest.

The following is a dated list of our captures, all the localities being in the Department of the Vosges, unless otherwise indicated:—

Carcharodus althææ.—St. Maurice, June 28th.

Hesperia alveus.—St. Maurice, August 3rd; Vallée de l'Ognon (Haute Saône), July 10th.

Nisoniades tages.—Charmes, July 30th.

Pamphila sylvanus.—St. Maurice, July 9th and 31st; Rouge Gazon, August 2nd.

P. comma.—St. Maurice, July 31st, August 3rd.

Thymelicus lineola.—St. Maurice, June 28th and 29th, July 6th.

T. flavus.—St. Maurice, June 29th and onwards; Charmes, July 2nd.

Chrysophanus hippothoë.—St. Maurice, June 28th to July 8th; Ballon de Servance, July 5th and 22nd; Le Tholy, July 7th. Also

by Mr. Barraud, Ballon d'Alsace, July 2nd; Ternuay (Haute Saône), July 10th.

C. alciphron (type).—St. Maurice, June 28th to July 18th; Le Tholy, July 7th; Rouge Gazon, August 2nd; Vallée de l'Ognon, July 10th.

C. dorilis.—St. Maurice, August 3rd; Charmes, July 30th (very abundant); Luxeuil-les-Bains (Haute Saône), July 23rd.

C. phlæas.—St. Maurice, July 3rd to August 3rd; Charmes, July 29th; Vallée de l'Ognon (Haute Saône), July 10th; Luxeuil-les-Bains (Haute Saône), July 23rd.

Lycæna arion.—St. Maurice, abundant during the whole of our visit; Charmes, July 14th; Le Tholy, July 7th; Vallée de l'Ognon (Haute Saône), July 10th.

Cupido minima.—Charmes, July 14th.

Nomiades semiargus.—Abundant at St. Maurice, June 28th to August 3rd; Le Tholy, July 7th; Charmes, July 14th, 29th, and 30th; Ballon d'Alsace, July 2nd. Specimens from Charmes, July 30th, in which the wavy line of spots on the under side of the primaries is represented only by the three nearest the costa. Luxeuil-les-Bains (Haute Saône), July 23rd.

Polyommatus corydon.—St. Maurice, August 3rd; Charmes, July 29th.

P. hylas.—Ballon de Servance, July 22nd; only one specimen seen.

P. alexis.—June 28th to July 18th; Charmes, July 30th; Vallée de l'Ognon (Haute Saône), July 10th.

P. astrarche.—Charmes, July 30th.

Rusticus argus.—July 28th to August 3rd; Charmes, July 29th; Le Tholy, July 7th; Vallée de l'Ognon (Haute Saône), July 10th; Luxeuil-les-Bains (Haute Saône), July 23rd.

Everes argiades.—St. Maurice, July 21st and August 2nd; Charmes, July 14th, 29th, and 30th; Rambervillers, July 15th; near Melisey (Haute Saône), July 10th.

Cyaniris argiolus.—St. Maurice, July 21st (one only).

Zephyrus quercus.—Vallée de l'Ognon (Haute Saône), July 10th.

Thecla ilicis var. *cerri.*—Le Tholy, July 7th; Charmes, July 14th; Rambervillers, July 15th; St. Maurice, July 12th.

Papilio podalirius.—St. Maurice, June 29th (seen but not captured).

P. machaon.—St. Maurice, July 11th to end of visit. Some show much increase in depth of ground colour, becoming quite orange.

Parnassius apollo.—Ballon d'Alsace, July 26th.

Aporia crataegi.—Abundant on our arrival at St. Maurice, June 28th, and still on the wing when we left.

Pieris brassicæ.—St. Maurice, July 31st and August 1st.

P. rapæ.—St. Maurice; first noticed July 2nd on the Ballon d'Alsace; a very yellow aberration, July 29th.

P. napi.—St. Maurice from June 30th to July 17th; Charmes, July 14th. Neither of the three species of *Pieris* was very abundant in the mountains.

Leptosia sinapis.—St. Maurice, July 5th, and becoming very abundant later in the month; Charmes, July 14th; Rupt-sur-Moselle,

July 23rd; Vallée de l'Ognon (Haute Saône), in great numbers, July 10th; Luxeuil-les-Bains (Haute Saône), July 23rd.—Ab. *erysimi*. St. Maurice, July 12th; Rambervillers, July 15th; by Mr. Barraud, Vallée de l'Ognon, July 10th.

Colias hyale.—Ballon d'Alsace, July 26th; St. Maurice, August 3rd; Charmes (abundant), July 29th; by Mr. Barraud, Ternuay (Haute Saône), July 10th.

C. edusa.—St. Maurice, July 9th, 12th, 21st, and 24th; Ballon d'Alsace, July 22nd; Charmes, July 29th; Vallée de l'Ognon (Haute Saône), July 10th; Luxeuil-les-Bains (Haute Saône), July 23rd.

Gonepteryx rhamni. — St. Maurice, July 2nd onwards; Charmes, July 30th; Vallée de l'Ognon (Haute Saône), July 10th.

Dryas paphia. — Common at St. Maurice throughout visit; Rambervillers, July 15th; Wesserling (Alsace), in great abundance, July 4th.

Argynnis aglaia.—St. Maurice, June 28th to August 3rd; Charmes, July 14th; Vallée de l'Ognon (Haute Saône), July 10th. Also by Mr. Barraud at Le Tholy, July 7th.

A. adippe.—Very fine forms at St. Maurice, June 28th to August 3rd; Wesserling (Alsace), July 4th. Var. *cleodoxa*.— St. Maurice, June 28th, and occasionally in July.

A. niobe.—St. Maurice, June 28th to August 3rd. Mostly var. *eris*, but some specimens of the type form were taken.

Issoria lathonia. — St. Maurice, June 28th, and occasionally throughout visit; Wesserling (Alsace), July 4th; Vallée de l'Ognon, and Col des Croix (Haute Saône), July 10th.

Brenthis euphrosyne.—Ballon d'Alsace, July 2nd.

B. selene.—St. Maurice, June 29th, and during July, especially on the Ballons; Charmes, July 29th and 30th. Mr. Barraud caught a remarkable specimen on June 28th at St. Maurice, in which the dark markings on the upper surface on the fore wing coalesced into irregular blotches.

B. daphne. — Wesserling (Alsace), July 4th; by Mr. Barraud, St. Maurice, July 3rd.

B. ino.—St. Maurice, June 29th, and throughout July, especially at the higher elevations; large female, 45 mm., Ballon de Servance, July 22nd.

B. dia. — St. Maurice, June 28th to August 3rd; Le Thillot, July 10th; Rupt-sur-Moselle, July 23rd; Vallée de l'Ognon (Haute Saône), July 10th.

Melitæa didyma.— St. Maurice, June 29th, and throughout July; Wesserling (Alsace), July 4th; by Mr. Barraud, Haut du Them (Haute Saône), July 10th.

M. parthenie.—St. Maurice, June 28th, 29th, and 30th.

M. athalia. — St. Maurice, June 28th to July 25th; Le Tholy, July 7th; Charmes, July 14th; Ballon de Servance, July 2nd; Ballon d'Alsace, July 26th; Rambervillers, July 15th; Luxeuil-les Bains (Haute Saône), July 23rd; Wesserling (Alsace), July 4th.

M. dictynna.—St. Maurice, June 29th and 30th, and July 1st; Ballon de Servance, July 2nd.

Arachnia var. *prorsa*. — Ternuay (Haute Saône), July 10th; St.

Maurice, July 11th; Rupt-sur-Moselle, July 23rd; Ballon d'Alsace, July 26th.

Pyrameis cardui.—Charmes, July 29th.

P. atalanta.—St. Maurice, July 25th.

Euvanessa antiopa. — St. Maurice, single specimen July 11th; becoming abundant, July 25th and onwards; Correvillars (Haute Saône), July 23rd.

Vanessa io.—St. Maurice, July 11th onwards; Ballon de Servance, July 5th.

Aglais urticæ. — St. Maurice, July 2nd onwards. Remarkably large and bright specimens, one measuring 59 mm., on the Ballon d'Alsace, July 2nd.

Eugonia polychloros.—Le Tholy, July 7th; St. Maurice, June 29th, and becoming abundant later.

Polygonia c-album.—Abundant the whole time of our visit.—Var. *hutchinsoni.*—St. Maurice, June 30th and July 22nd.

Limenitis populi var. *tremulæ.* — Ballon d'Alsace, July 2nd, by Mr. Barraud.

L. camilla.—St. Maurice, June 28th and 29th, July 11th and 12th; Le Tholy, July 7th; Wesserling (Alsace), July 4th.

L. sybilla.—Rather abundant throughout the district, but in poor condition; June 28th and onwards.

Apatura ilia ab. *clyte.*—Charmes, July 14th.

A. iris.—St. Maurice, July 8th onwards; Ballon d'Alsace, July 2nd; Charmes, July 14th; by Mr. Barraud, Le Tholy, July 7th.

Pararge mæra.—St. Maurice, June 28th to end of July; Le Tholy, July 7th.

P. megæra.—Charmes, July 29th.

P. egeria.—Charmes, July 29th; Luxeuil-les-Bains (Haute Saône), July 23rd.

P. achine.—Charmes, July 14th; Rambervillers, July 15th.

Enodia dryas.—Rambervillers, July 15th (one).

Hipparchia semele. — St. Maurice, July 17th, 26th, and 28th; Charmes, July 29th; by Mr. Barraud, St. Maurice, July 5th.

Epinephele jurtina. — Abundant at St. Maurice during the whole of our stay; Vallée de l'Ognon (Haute Saône), July 10th; by Mr. Barraud at Le Tholy, July 7th.

E. tithonus. — Charmes, July 29th and 30th; Luxeuil-les-Bains (Haute Saône), July 23rd.

Aphantophus hyperanthus.—St. Maurice, June 28th onwards.

Cœnonympha arcania. — Le Tholy, July 7th; Charmes, July 14th.

C. pamphilus.—St. Maurice, June 28th onwards; Charmes, July 30th.

C. typhon.—St. Maurice, July 25th (one only).

Erebia epiphron.—Ballon d'Alsace, July 26th.

E. stygne.—St. Maurice, June 28th onwards. In places the most abundant butterfly.

E. ligea.—St. Maurice, July 1st onwards. Not taken below about 2000 ft.

FOUR NEW SPECIES OF THE GENUS *ERETMAPODITES* (THEOBALD) FROM ASHANTI.

By W. M. GRAHAM, M.B.,
Director Medical Research Institute, Lagos.

(Concluded from p. 89.)

3. *Eretmapodites chrysogaster*, nov. sp.

♂. The head is covered, as in No. 1, with dense parti-coloured flat scales in front, and in a triangular area behind with golden, narrow-curved, and black upright and golden upright forked scales. Six bristles project forward between the eyes, the anterior pair being golden in colour.

Antennæ: Plumose, the verticillate hairs pale brown. There are a few black scales on the basal segment, and the second segment is scaled also. The two apical segments are three times the length of the others.

Palpi: Thin, acuminate, shorter than proboscis, without plum hairs, black. Proboscis: Long, thin, blue-black, curved apically. Clypeus: Dark brown, nude.

Thorax: The mesonotum is covered with mingled black, narrow-curved and golden, narrow-curved scales. Three parallel longitudinal narrow black bands run backward over the central portion, the median black band being continued to the scutellum by a band of golden scales. The edge of the mesonotum is surrounded by an interrupted border of golden scales.

Scutellum: The middle lobe is covered with a median band of white and two lateral bands of purple flat scales. There are four long bristles and some shorter ones on the edge. The lateral lobes are covered with golden, narrow, and black, narrow-curved scales.

Pleuræ: A dark golden colour, with patches of silvery white flat scales on meso- and meta-pleura, as in No. 1. The prothoracic lobes are covered with dense silvery white flat scales, and the apex of the prosternum with similar scales, as in No. 1.

Halteres: Base pale, stalk and knob covered with bluish flat scales. Metanotum: Brown, with five hairs and a few golden, narrow-curved scales at the apex.

Abdomen: The venter is pale golden, with apical black bands on the fifth, sixth, and seventh segments. The dorsum and sides are velvety black, with triangular lateral white spots, the apex of the triangle being towards the dorsum and the base resting on the edge of the golden venter. There is an apical, dorsal, silvery band on the seventh segment.

Legs: A blue-black, with apical white bands on the femora of the third pair. The last two segments of the hind tarsi are feathered with elongated black scales.

Ungues: First pair equal, one simple, one uniserrate; second pair same as first pair; third pair equal, small, simple. The last segment of the tarsus of the first and second pairs has a stout tooth

or thorn on the ventral surface inserted immediately behind the joint. There is no such tooth on the tarsus of the third pair.

Wings: Very darkly scaled with Trichoprosopon-like scales, bluish and markedly ribbed. First submarginal cell one-fourth of its length longer than the second posterior cell. The stem of the first submarginal is about two-thirds the length of the cell. The supernumerary and mid cross-veins are close together, the posterior about its own length towards the base of the wing. The sixth vein turns at right angles to the costa just before its termination.

Genitalia: The claspers are long, curved, and without terminal articulate spine, covered, the basal half with scales, the distal half with seven long hairs. The harpes are long, curved, and expanded into a flattened blade tapering to a rounded point.

Length: 5 mm.

♀. Head as in male. Antennæ: Much less plumose; otherwise similar to those of the male. Palpi: Short, black-scaled, acuminate.

Proboscis, clypeus, thorax, scutellum, pleuræ, prothoracic lobes, halteres, metanotum: As in male.

Abdomen: As in male, and with the dorsal silvery band on the seventh segment complete.

Legs: As in the male, but the last two segments of the hind tarsi are of normal form, *i. e.* unfeathered.

Ungues: First pair equal, uniserrate; second pair equal, uniserrate; third pair equal, simple.

Wings: Colour and scales as in male. First submarginal cell one-fifth of its length longer than the second posterior cell. The stem of the first submarginal is usually one-third the length of the cell. The supernumerary and mid cross-veins are close together, the posterior about its own length towards the base of the wing. The sixth vein is as in the male.

Length: 6 mm.

Habitat. Obuasi, Kumasi, Dompoasi; taken in bush August to November. Also reared from larvæ taken in a small collection of water in the hollow of a tree near Dompoasi, Aug. 14th.

4. *Eretmapodites melanopous*, nov. sp.

♂. Head, antennæ, palpi, proboscis, clypeus: As in No. 3.

Thorax: As in No. 3, but the ground colour is somewhat darker brown, and black scales predominate.

Scutellum, pleuræ, halteres, metanotum: As in No. 3.

Abdomen: Is a velvety black, with basal white ventral banding, the bands showing laterally, and gradually becoming more apical till the apex is white ventrally on the sixth segment. There is a yellow spot on the sixth and seventh segments of the venter. The white banding becomes dorsal on the seventh segment, but the lateral spots do not meet in the middle line.

Legs: As in No. 3, but the hind tarsi are unfeathered.

Ungues: First pair unequal, simple; second pair unequal, simple; third pair equal, simple. The terminal segment of the tarsus of the first pair has two strong teeth inserted immediately behind the joint.

The terminal segment of the second pair has two short thick teeth, differing in shape and insertion from those of the first pair. There are no teeth on the tarsi of the third pair.

Wings: As in No. 3, but first submarginal cell is about one-third of its length longer than the second posterior, and the stem of the first submarginal cell is about one-half the length of the cell. The supernumerary and mid cross-veins are close together, the posterior cross-vein about its own length towards the base of the wing.

Genitalia: The claspers are long and curved and without terminal articulate spine, and generally as in No. 3.

Length: 5 mm.

♀. Head as in male. Antennæ; Less plumose, and as in female, No. 3. Palpi: Short, black, acuminate.

Abdomen: As in male almost exactly, the dorsal silvery band on the seventh segment being incomplete in the middle line, as in male.

Legs: As in male.

Ungues: First pair equal, uniserrate; second pair equal, uniserrate; third pair equal, simple.

Wings: As in male, but first submarginal cell is one-fourth of its length longer than the second posterior cell, and the stem of the first submarginal cell is somewhat more than one-third the length of the cell. Cross-veins as in the male; sixth vein as in the male.

Length: 6 mm.

Habitat. Obuasi in June, July, August, October, and November, in bush, between 11 a.m. and 3 p.m.

NOTES AND OBSERVATIONS.

Nonagria neurica in the Maddison Collection. — I see the 'Entomologist' on p. 124 records that the late Mr. Maddison's melanic *Nonagria neurica* came from Horning. This was an error in the label, as these *N. neurica* came from myself, and were not Norfolk specimens. So far as I know, melanic examples of *N. neurica* have not been taken at Horning, where Messrs. Bowles, Edelsten, and myself have taken very many specimens of the typical form.—A. Robinson; 5, King's Bench Walk, Temple, E.C., May 4th, 1909.

Saturnia pavonia, ab.—Yesterday I captured a rather remarkable variety of *Saturnia pavonia*, which I should describe as a "blind" variety, as it has the spots where the eyes usually are blank. This is probably the rare variety mentioned in 'Moths of the British Isles.' The spots on all four wings are identical. The centres are filled in with pale fuscous colour, with no shading whatever. I took the specimen on the Quantock Hills near here. It is a fine male. By the way, the species seems well-established here, as I saw over two hundred in just over an hour and a half.—W. A. Bogue; The Bank House, Watchet, Somerset, May 3rd, 1909.

Gynandrous Amorpha populi.—Although I believe gynandrous specimens of *A. populi* are, comparatively speaking, common, it may be of interest to record that I have just bred a very fine one, left side

male, right female. The right-hand wings are longer and narrower than those on the left, giving the insect a slightly lop-sided look; their colour, too, is very much duller and browner than those on the male side. The antennæ correspond, that on the left being much stouter and longer and much more strongly pectinated than that on the right; also the legs, those on the male side being much stouter and more hairy than the corresponding female ones. There is also a distinct ridge or dividing line down the exact centre of the body, the shade of colouring on either side matching the wings, and the male anal tuft is confined to the left side; so that it seems to be a fairly evenly divided insect. I bred it from a larva found here last year.—P. A. Cardew (Capt.); St. Aldwyns, Park Avenue, Dover, May 10th, 1909.

Catocala fraxini in Sussex.—A fine female of this species was taken at rest on the trunk of an old poplar near the railway-station at Horsham, on Sept. 3rd, 1908, by Mr. A. James, of Tooting Groove. The moth was placed in a muslin cage, fed with syrup on a sponge, and obligingly laid about one hundred and twenty eggs, after knocking itself about somewhat in a vain attempt to escape, having in view, I suppose, that something more succulent than dry muslin to eat would be necessary for its future progeny. The ova, some of which I have in my possession, commenced to hatch on 4th inst., and some few have not yet hatched (14th inst.). A few of the larvæ are now in the second instar, but I regret that rather a large percentage of the young larvæ died in moulting. I had an opportunity of inspecting the parent moth; it was also exhibited, I understand, at the South London Entomological Society in April. I am informed that there have been several captures of this exceedingly rare species in Surrey and Sussex during the past few years.—J. J. Jacobs (Lieut. R.E.); Gillingham, Kent, May 14th, 1909.

A Nature Study Exhibition, organised by the Nature Study Society, will be held at the Royal Botanic Gardens, Regent's Park, N.W., on Friday and Saturday, June 4th and 5th. Open each day from 10 am. to sundown. It will include Aquaria, Vivaria, and other means of observing animals, with photographic and microscopic illustrations. Tickets and all particulars may be obtained of Miss Winifred de Lisle, Hon. Sec. of the Committee, 58, Tyrwhitt Road, Brockley, S.E.

CAPTURES AND FIELD REPORTS.

Colias edusa in May.—I saw a specimen of *Colias edusa* to-day. —Frank W. Fisher; Cranborn, Salisbury, May 19th, 1909.

Notes from the South Midlands.—My brother took a male specimen of *Cerura bifida* on a poplar-trunk at Peterborough yesterday (April 26th). On the same day a *Notodonta dromedarius* taken in the district emerged in my breeding-cage. The season has been very early this year. Sallow was almost over here before it came out in the New Forest or in Sussex, and I have Feb. 5th as a date for *Hybernia leucophæaria* and *Lycia* (*Biston*) *hirtaria*. *Tæniocampa*

miniosa was extremely abundant in the Northants woods this year, and I took some very unusual varieties of *T. munda*. *Apocheima hispidaria* taken near Bedford Purlieux on March 18th seems a new locality. I believe it is not previously recorded in the district.—C. Mellows; Brasenose College, Oxford.

Acherontia atropos in May.—On the evening of the 10th inst. a working-man brought me one of these moths, which had just settled on his trousers below the knee, and had then run up his leg as he was walking in the street. When he caught it in his hand he said "it squeaked just like a mouse," and he was rather afraid of it. However, he took it home and placed it under a tumbler, and then brought it to me. It was a male, and rather a fine dark one, and would have been quite perfect but for a piece chipped out of one of its hind wings, doubtless by its captor. I kept it in a breeding-cage all night, and released it the next evening as soon as it began to move about, and it looked like a small bird as it flew off in the gloom. The species is not often seen at this time of the year in Britain.—Gervase F. Mathew; Dovercourt, May 12th, 1909.

SOCIETIES.

Entomological Society of London.—*Wednesday, March 17th*, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Capt. E. Bagnell-Purefoy, The Cottage, East Farleigh, Maidstone; Mr. Stanley A. Blenkarn, 44, Romola Road, Tulse Hill, S.E.; Mr. Leonard Box, the Floral Nurseries, Hailsham, Sussex, and 28, St. James's Street, Bedford Row, W.C.; Mr. Henry Britten, Prospect House, Salkeld Dykes, Penrith; the Rev. C. R. N. Burrows, of Mucking Vicarage, Stanford-le-Hope; and Mr. W. A. Rollason, "Lamorna," Truro, were elected Fellows of the Society.—M. A. Janet, member of the Entomological Society of France, and M. Severin, member of the Entomological Society of Belgium, were present as visitors.—Mr. H. Rowland-Brown exhibited two extreme forms of *Chrysophanus phlæas* from Norwegian Finmarken and the Mediterranean region, drawing attention to the apparent identity of the form from Arctic Europe—*hypophlæas*—with the species described as *americanus* from North America. He also showed series of *Plebeius argyrognomon*, Brgstr. taken by him at Alten and Abisko, Swedish Lapland; *P. argus* var. *corsica* from Corsica; and *P. argus*, approaching var. *bella*, H. S., from Digne, Basses-Alpes.—Mr. H. Hamilton Druce also brought for exhibition examples of *Plebeius argus*, L., taken by him in various localities in Russia.—Mr. G. Meade-Waldo exhibited a gynandromorphous example of *Euchloë cardamines*, bred from a larva found at Hever, Kent.—Mr. H. M. Edelsten brought for exhibition stereoscopic photographs of the anal segments of *Cœnobia rufa*, female, showing the spines which are driven into the dead stems of *Juncus lamprocarpus* during oviposition.—Mr. W. Schmassman showed, on behalf of Mr. H. Welte, a curiously marked female of *Chrysophanus hippothoë* from Goeschenen, Switzerland. The black spots, forming the marginal row on the under side of the two

fore wings and one of the hind wings, were elongated. The other hind wing and the wings on the upper side were normal. Mr. C. O. Waterhouse sent for exhibition living males and immature females of the mammoth scale-insect which infests the M'sasa tree in Rhodesia: also a dead example of the fully-grown female scale. They are what are known in collections under the generic name *Monophlœbus*. The female has been named *Lophococcus maximus* by Mr. Lounsbury.—Mr. E. A. Butler exhibited one species of Coleoptera, and five of Hemiptera, recently added to the British Fauna; also the unique example of *Mymecocoris gracilis*, Sahlb., taken by him at Fleet, Hants, in August, 1903.—Mr. E. J. Arrow exhibited examples of a Cetoniid beetle, *Dicronorrhina* (subg. *Neptunides*) *manowensis* Moser, to show injuries of a remarkable character. In all the marks were perfectly symmetrical and occupied exactly the same position. —Dr. K. Jordan exhibited the polymorphic *Papilio lysithous* and *P. hectorides* from Brazil, and the models which they imitate. The exhibit illustrated a phenomenon observed in various groups of butterflies: that a mimetic species is broken up into a number of very different-looking individual varieties, which are all specifically the same, while the imitated models are specifically distinct from one another. He also exhibited both sexes of the peculiar Peruvian butterfly, *Styx infernalis*, described by Staudinger as a Pierid, but certainly an Erycinid in the structure of the antenna, thorax, legs, neuration, and the egg. Dr. Jordan also showed, on behalf of the Hon. N. Charles Rothschild, an *Acrotylus* which Mr. Rothschild had observed in some numbers in the desert on the Upper Nile. The colour of these small locusts so closely agrees with that of the sand and the pebbles (also exhibited) that, when settled, the insects disappear entirely from view.—Mr. J. W. Tutt opened a discussion on the affinities of the two Palæarctic species, *Plebeius argus*, L. (*ægon*, Schiff.; *argyrotoxus*, Brgstr.) and *P. argyrognomon*, Brgstr. (*argus* auctorum). After giving an account of the confusion in nomenclature, he proceeded to explain the structural and superficial differences of the respective imagines. It was also remarkable to note that both showed a parallel range of varieties in the mountain, plain, and southern forms. Dr. T. A. Chapman then gave a demonstration with the lantern, illustrated by many slides, of the structural differences of the two species in the larval and imaginal stages, and criticized the opinion expressed by Staudinger that *argus* and *argyrognomon* have not yet entirely developed into separate species. The microscopic preparations showed that the "claw" or spine over the front tibiæ in *argus* was not even represented in rudimentary form in *argyrognomon*.

Wednesday, April 7th.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. R. Shelford exhibited a number of examples of mimetic Blattidæ, the models being Coleoptera, principally Coccinellidæ, and Chrysomelidæ.—Mr. H. M. Edelsten showed some ova of *Tapinostola fulva* (*in situ*) laid within the curled leaf of *Carex paludosa*; also a photograph of the anal segments of the female, showing the ear-like appendages, from the ventral side. These, when not in use, are carried flat, but when the female is going to lay, they are folded together and thrust between the curled edges of a leaf to force it apart; the fold makes a hollow in which the ova are

deposited; and the leaf closes over the ova when the appendages are withdrawn. The discussion on the two similar species, *Plebius argus* and *P. argyrognomon* was resumed and concluded.—Mr. H. St. J. Donisthorpe read a paper "On the Origin and Ancestral Form of Myrmecophilous Coleoptera."—Mr. W. L. Distant communicated a paper on "Rhynchota Malayana."—Mr. J. E. Collin communicated a paper by Mr. Wesché "On the Antennæ of Diptera, and the Present Classification of the *Nemocera*, with two subsidiary sections bearing on the latter subject."—Mr. G. A. K. Marshall then read a paper entitled "On Reciprocal Mimicry. A Rejoinder to Dr. F. A. Dixey." Dr. Dixey had taken the view that within the limits of a Müllerian association every species exercises a mimetic influence upon every other, the amount of the influence depending upon its dominance, which is determined by its numbers, distastefulness, and general notoriety. Thus, as between any two species, the mimetic approach would be mutual and result in an interchange of characters. This interchange would be proportionate to the relative dominance of the two species; where this is unequal, the weaker species would take on, to a considerable extent, the superficial appearance of the stronger, while the latter would adopt only some small characters from its mimic; but where the dominance is equal, the interchange would be equal, so that this would constitute the optimum condition for the production of reciprocal mimicry. On the other hand, Mr. Marshall contended that this gravitational conception of mimicry was really based on a false analogy and was at variance with the real principle of Müller's theory. While admitting the theoretical possibility of mimetic interchange, he urged that a logical application of Müller's argument would lead to the view that mimetic approach would be one-sided only, that is, from a weaker species towards a stronger and even in an opposite direction; further, that when the relative dominance of the two species was equal, the mere operation of Müller's factor would produce no mimetic effect until some other factor had first produced a condition of inequality. On this view mimetic interchange would never be mutual and simultaneous, but would only result from a complete reversal of the relative dominance of the two species during the production of the mimetic resemblance. For this process he had suggested the name of "Alternate Mimicry." Mr. Marshall said also that he was compelled to reject entirely Dr. Dixey's new hypothesis as to the "function of the double aposeme," because it completely left out of consideration the differences and resemblances between the various forms regarded from the standpoint of general facies; he contended that resemblance in general effect was of the first importance in considering mimetic relationship, and that this new hypothesis was liable to be extremely misleading on account of the exaggerated significance which it attached to the merely partial resemblance which might be said to exist between two species possessing a single conspicuous feature in common but differing markedly in other respects. Moreover, not only was the theoretical position of Reciprocal Mimicry very unsatisfactory and unconvincing, but, further, the cases which had been cited as proving its actual occurrence in nature appeared open to serious criticism. For while in some cases the facts did not appear to justify the assertion that an

interchange had taken place, in the others such an interpretation involved many difficulties which disappeared when the mimetic phenomena were interpreted as being due to the simple mimicry of one form by another. Dr. Dixey stated that he did not consider the Presidential chair to be a proper place in which to reply to Mr. Marshall's criticism, and that he would therefore deal with the points at issue on some future occasion. Mr. C. J. Gahan very strongly supported the opinions advocated by Mr. Marshall, and expressed the view that while Dr. Dixey professed to support Müllerian mimicry yet his defence of Reciprocal Mimicry really constituted a severe attack upon that theory. Mr. S. A. Neave said that as a result of his field experience in Africa he was unable to accept the theory as to the function of "double aposemes," but he did not mean thereby to imply that he rejected every case of Reciprocal Mimicry. He suggested that Alternate Mimicry might not be so uncommon a phenomenon as Mr. Marshall appeared to think. Mr. Tutt, Mr. W. E. Sharp, and Professor Hudson Beare also made some brief comments on the subject.—H. Rowland-Brown, M.A., *Hon. Sec.*

The South London Entomological and Natural History Society.—*March 11th*, 1909.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. West (of Greenwich) exhibited another section of the Society's reference collection which he had remounted and arranged. —Mr. South, a short series of *Acidalia degeneraria* received from Mr. J. Walker, of Torquay, and pointed out that they were lighter in colour than the Portland form.—Mr. Newman, specimens of *Cleora angularia* (*viduaria*), a pair of *Phibalapteryx polygrammata* ab. *olivacea*, and ab. *obsoleta* of *Camptogramma fluviata*, and four melanic examples of *Notodonta ziczac*.—Mr. Kaye, a drawer of aberrations and geographical races of *Cosmotriche potatoria*. — Messrs. Tonge, Harrison, Main, Joy, Moore, Grosvenor, Pickett, Turner, Dr. Chapman, Dr. Hodgson, and Rev. G. Wheeler, a large number of species, races, and forms of the "blue" butterflies to illustrate Mr. Tutt's remarks on the family. Mr. Tonge also exhibited photographic life-histories of the "blue" butterflies. Mr. Tutt then gave a "Gossip on the Blue Butterflies," summarising all that was known of their life-histories and relationships, pointing out modern ideas of the grouping, and emphasizing the necessity of the genera being based upon the sum total of our knowledge of the species and their habits in all stages.

March 25th.—The President in the chair.—Mr. A. E. Gibbs, F.E.S., of St. Albans, Mr. A. W. Buckstone, of Chiswick, and Mr. J. H. Rohde, of Reigate, were elected members.—Mr. G. B. Brown exhibited specimens of *Eubolia bipunctaria* from Branscombe and Dawlish, and pointed out their reddish suffusion compared with specimens exhibited from Horsley. He also showed specimens of *Agriades corydon* having slight reddish suffusion.—Mr. Hy. J. Turner, a box of butterflies recently obtained from Columbia.—Mr. Tonge, an under side of *Acronycta psi*, in which the central black spot was produced towards the base as a line.—Mr. Bowman, a very pale female of *Nyssia hispidaria* from Chingford.—Mr. Coote, ova of the same species, and a female specimen of *Anisopteryx æcularia*.—Mr. Kaye, specimens of *Chrysophanus dispar*, and a short series of *Xylina furci-*

fera (*conformis*).—The remainder of the meeting was devoted to an exhibition of lantern slides by Messrs. Tonge, Dennis, West (Ashtead), Main, Step, and Lucas.

April 8th.—The President in the chair.—Mr. Hemmings and Mrs. Hemmings, of Horley, were elected members.—Mr. Newman, a living female of *Asteroscopus nubeculosa*, bred that morning after being four years in the pupal stage.—Mr. Main, ova-cases of a leaf insect from Ceylon, each containing one ovum. The species was parthogenetic, males being rarely produced. — Mr. Turner, a series of the delicate Pyrale *Glyphodes sinuata* from the Ja River, Cameroons.—Mr. Adkin read a short paper entitled " Notes on a Series of *Boarmia repandata*, with some Remarks upon the Variation and Distribution of the Species in Britain," and exhibited long series of the species in illustration of the paper. — Mr. Turner read the Report of the Society's Visit to the Zoological Museum, Tring, on March 27th. About thirty members and friends were present.

April 22nd. — The President in the chair. — Mr. Tonge exhibited remains of an unusually dark *Catocala fraxini*, taken at Horsham in 1908, with some of the ova laid by it. — Mr. West (Ashtead), living larva of a stick-insect, feeding on privet-leaves. — Mr. Joy, a pupa of *Cyclopides palæmon*. The larva hybernated from mid-October in a tent among grass, emerged in the spring, wandered but did not feed, and had just pupated. He referred to a brood of *Brenthis euphrosyne*, of which, on March 15th, forty-five out of about eighty were alive. The subsequent severe weather killed off all but four, of which two had already turned to pupa. — Mr. Rayward, ova *in situ*, found wild, of *Polygonia c-album*. They were always near the apex of the leaf on the upper side.—Mr. Tonge read a paper, " The Resting Positions of Butterflies and Moths," illustrating his remarks with a large number of admirable lantern-slides, many of them from photographs taken on the occasions of the various field meetings of the Society. — Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society.—*February 16th*, 1909. —Exhibits were practically confined to *Pseudoterpna cytisaria*, which was the subject of the paper appointed to be read on this occasion by Rev. C. R. N. Burrows.

March 2nd, 1909.—A special exhibit of *Polyommatus phlæas* was the feature of the evening. Dr. T. A. Chapman exhibited various European and extra-European series, including examples from Sicily (? spring brood) lighter in colour and with black markings less pronounced than in normal English specimens; from Spain (? summer brood), mostly var. *eleus* or abs. approaching thereto ; from Teneriffe with black markings accentuated as regards both size and depth of colour, but with ground colour clear and bright; from Japan, some with ground colour and others with same suffused with black ; and from India, all with ground colour completely obscured with smoky suffusion. English specimens, with copper marginal band on hind wings broken up into alternate dashes of copper and black, were exhibited by Messrs. S. J. Bell and L. W. Newman, while Mr. J. E. Shaw showed an ab. with entirely black hind wings from Darenth, and var. *eleus* from Bexley. — Mr. H. M. Edelsten, *Camptogramma*

fluviata bred from South Devon female, the larvæ having all pupated (save two) on one day, and the imagines having all (save two) emerged during one day. — Mr. J. Riches, larvæ of this species fed on dandelion in a hot-house; also a specimen of *Arctia caia* with usual black markings on hind wings restricted to three marginal blotches. — Mr. A. J. Wellsdon, *Phigalia pedaria*, bred from wild Yorks melanic female; about ten per cent. of the brood were melanic, a few light-coloured, and the rest intermediate forms.—S. J. Bell, *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, March 15th, 1909.—Mr. C. E. Stott, Vice-President, in the chair. — A paper was read by Mr. H. R. Sweeting entitled "The Value of Variation to a Species." — Mr. W. Mansbridge exhibited specimens of *Amphidasys betularia*, and its variety *doubledayaria*, which had been bleached by exposure to chlorine; also *A. strataria*, which had been kept alive in an atmosphere containing a considerable amount of chlorine for forty-eight hours, also a specimen which had been killed in a strong atmosphere of chlorine. In the former experiment, *A. strataria*, compared with a check specimen, showed no bleaching, but in the latter the insect died in one minute, and the dark markings were at once bleached to light brown.—Mr. C. E. Stott communicated notes on recent additions to the local list of Coleoptera, and exhibited, on behalf of Dr. Knight, of St. Annes, a tube containing a number of Glossiniæ (tsetse flies). — Mr. W. A. Tyerman exhibited *Agrotis exclamationis* var. *nigra* and a specimen of *Aplecta occulta* from Ainsdale.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

The Manchester Entomological Society.—*March 3rd*, 1909.—The President, Mr. C. F. Johnson, in the chair.—Mr. J. E. Cope read a paper, "Coleoptera, with special reference to the family Lamellicornia," illustrating his remarks on their structure with several well-dissected specimens, and showed various species lent by Mr. J. Ray Hardy.—Mr. L. Nathan exhibited an orthopteron—*Blatta americana* —taken in Princess Street, Manchester. — Mr. A. W. Boyd, part of an autumn brood of *D. pudibunda* (Delamere ova).—Mr. J. B. Garnett, entomological apparatus.

April 7th, 1909.—The President, Mr. C. F. Johnson, in the chair. —Mr. W. Mansbridge, F.E.S., exhibited long and varied series of *Peronea hastiana* from Wallasey, and of *Pædisca corticana* from Delamere and St. Annes. — Mr. C. Clark, *G. papilionaria*. — Mr. J. E. R. Allen, M.A., a series of *H. leucophæaria* from Kent.—Mr. N. H. Davison, a series of *Phigalia pedaria*; types and var. *monacharia*; *H. leucophæaria*, including two very dark forms; and *O. vaccinii*—all from Dunham Park, Cheshire, this spring.—Mr. B. H. Crabtree, F.E.S., *C. dominula* (yellow form); *A. villica*, with large cream tips to the fore wings; *A. grossulariata* vars. *chalcozona* and *lacticolor*.—Mr. R. Tait, Jr., series of *A. nebulosa*, types and vars. *robsoni* and *thompsoni* from Delamere; series of *E. prasina* (*herbida*), Nov. 1908, Brockenhurst.—A. W Boyd, B.A., *Hon. Sec.*

RECENT LITERATURE.

A Guide to the Natural History of the Isle of Wight. Edited by Frank Morey, F.L.S.; with contributions (on Insecta) by Malcolm Burr, B.A., F.E.S., F.L.S., F.Z.S., F.G.S.; W. J. Lucas, B.A., F.E.S.; Claude Morley, F.E.S., F.Z.S.; E. A. Newbery; Horace St. J. K. Donisthorpe, F.Z.S., F.E.S., &c.; E. A. Butler, B.A., B.Sc., F.E.S.; and Hubert F. Poole. Pp. xx, 560; with Map. Isle of Wight: The County Press, Newport. London: William Wesley & Son. 1909.

This bulky volume deals with the whole of the natural history of the island, and, considering that it is but some three years since the project was initiated by the editor, we consider that the result goes far to show him worthy of the trust suggested by its production. Fuller working of the central inland districts, and especially of the woods and open ground, would add considerably to the various faunistic lists, since the heel of the invader from dingier climes is shown all along the coast-line, more particularly at the "back" of the island. But the resident naturalists are few, though all such appear to have most liberally assisted in the satisfactory issue, which is evidenced by the totals:—Orthoptera, 23 species; Neuroptera, 29 species; Hymenoptera, 472 species; Coleoptera, 1434 species; Lepidoptera, 972 species; Diptera, 281 species; and Hemiptera, 324 species. All these, however, are obviously open to augmentation, and we trust those who sojourn or have sojourned in Vectis will comply with the editor's request, suffixed to his excellent Preface, for further information upon their especial groups.

C. M.

Catalogue of the Lepidoptera Phalænæ in the British Museum. Vol. vii. By Sir George F. Hampson, Bart. Pp. i–xv, 1–709; with Atlas of fifteen coloured plates. London: Printed by Order of the Trustees. 1908.

The bulky volume under notice, which is the fourth dealing with the classification of the Noctuidæ, treats of the Acronyctinæ. The author states that, as there are about three thousand species belonging to over three hundred genera referable to this subfamily, their consideration will occupy two other volumes, in addition to the present one in which over eight hundred species and rather less than one hundred genera are entered and described. Thirty-seven of the genera have each but one species, and sixteen others have thirty-six species between them; three genera (*Trachea*, *Perigea*, *Eriopus*), on the other hand, embrace a total of two hundred and seventy species.

In *Trachea*, Ochsenheimer, = *Achatia*, Hübner, Tent. (t. *atriplicis*, L.), are merged *Phosphila*, Hübn. (t. *turbulenta*, Hübn.), *Hama*, Steph. (t. *anceps*, Schiff.), *Berrhœa*, Walk. (t. *aurigera*, Walk.), *Chandata*, Moore (t. *partita*, Moore), and *Epa*, Beth.-Baker (t. *pratti*, Beth.-Baker).

According to our author, *nigricans*, Vieweg, is an earlier name for *abjecta*, Hübner, but is not eligible in this connection; he, however,

rescues *oblonga*, Haworth (1809), from the obscure position assigned it by Stephens and others, as a form of *gemina*, Hübner, and adopts it as a prior name for the species known as *abjecta*, Hübn.

Although Stephens was certainly in error in quoting *ferruginea*, Esper, as the type of his genus *Rusina*, there is little doubt that his specific description and generic characters were obtained from *umbratica*, Goeze, = *tenebrosa*, Hübn. It is to be regretted, therefore, that *Rusina* has been sunk in *Amathes*, Hübn. (Cat. Phal. vi. 470), and in the present volume *Stygiostola* set up for *umbratica*, Goeze.

Under *Oliga*, Hübner (t. *strigilis*, Clerck), we have *Miana*, Stephens (t. *literosa*, Haworth), and *Photedes*, Lederer (t. *captiuncula*). Other British species included in this genus, besides those usually assigned to *Miana*, are *ophiogramma*, Esp., *scolopacina*, Esp., and *havorthi* (*haworthii*, Curtis).

Crymodes, Guenée (t. *cervina*, Germar, = *maillardi*, Geyer, = *exulis*, Lef.), is merged in *Eremobia*, Stephens (t. *ochroleuca*, Schiff.).

Fissipuncta, Haworth, = *ypsilon*, Schiff., and *zollicoferi* (*zollikoferi*, Freyer), are both referred to *Sidemia*, Staudinger (t. *speciosa*, Bremer). *Testacea*, Schiff., *nickerlii*, Freyer, and *dumerilii*, Duponchel, which, with two other species, Staudinger places under *Apamea*, O.-Treit., are here retained in *Luperina*, Boisduval (t. *dumerili*).

Lithoxylea, Schiff., is the type of *Xylophasia*, Stephens (1829), also of *Septis*, Hübn. (Verz., p. 243), and of *Xylena*, Hübn. (Tent.), but as this species is congeneric with *hepatica*, Linn., which is the type of *Parastichtis*, Hübn. (Verz., p. 212), the latter genus is adopted for the species just mentioned and their allies.

On the fifteen coloured plates are four hundred and eighty figures. In addition to a systematic index at the beginning of the volume, there is a very full alphabetical index (sixteen pages) at the end.

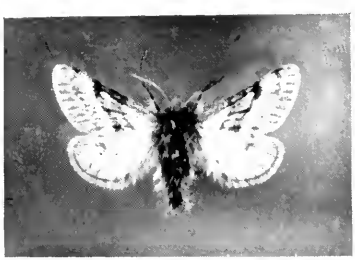
OBITUARY.

Edwin C. H. Davies belonged to that class of working-man naturalist which is so fast dying out with the progress made by so-called Nature Study in our modern educational system. He was born at Porkellis, near Helston, in Cornwall, and had lived for thirty-two years at St. Issey, where he filled the post of rural postman, doing a twelve-mile round daily for the last sixteen years. As a volunteer he became associated with Dr. Griffin, of Padstow, and it is from him and Rev. J. A. Crawshay, his acting vicar for some months, that he appears to have got his taste for natural history. Davies contributed lists of the Ichneumonidæ and Aculeate Hymenoptera to the Victoria History of Cornwall, was interested in Coleoptera, &c., and added botanical records to the 'Flora of Cornwall,' by F. H. Davey, F.L.S., which will shortly be published. He died of consumption on Jan. 12th last, aged thirty-seven years, leaving an aged mother and young married sister. His Hymenopterous collection has passed to Mr. W. A. Rollason, of Truro, who supplies these details.

C. M.

EPICNAPTERA ALICE, *John.*

1



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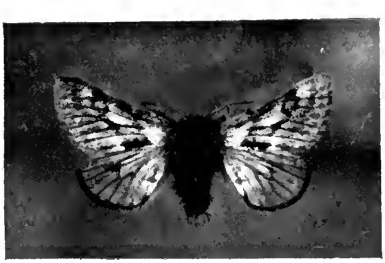

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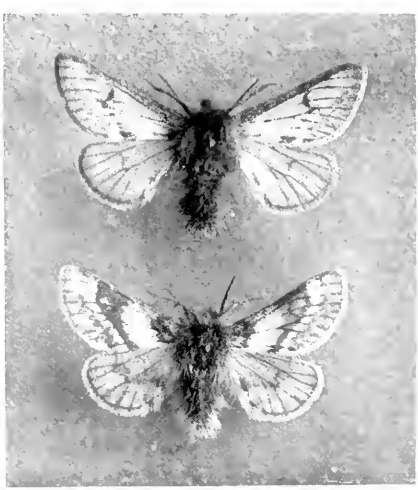


VARIETIES OF N. LAPPONARIA.

THE ENTOMOLOGIST

VOL. XLII.] JULY, 1909. [No. 554

FURTHER VARIATION IN *NYSSIA LAPPONARIA*.

BY E. A. COCKAYNE, M.A., F.E.S., F.L.S.

(PLATE V.)

AMONGST a very large number of males of *Nyssia lapponaria* which I have examined since I wrote my note in the 'Entomologist,' vol. xxxvii. p. 249, the following forms seem worthy of record :—

In 1906 Mr. F. W. J. Jackson bred a very remarkable aberration from eggs which I obtained in the Rannoch district. In the fore wing of this (fig. 1), a very small specimen, the third line is moved inwards so far from the termen that it passes through and obscures the discal spot. The second line is also moved inwards and joins the third about halfway across the wing. The first line is further than usual from the base of the wing, and runs almost parallel to the second, actually touching it at a point a short distance from the costa. Thus all three lines are partially fused, and the large space which usually exists between the first and second line is almost obliterated. Similar aberrations are well known in many other Geometridæ.

Fig. 2 shows a melanic specimen in which the second line, though indistinct, does touch the first, but the third line is in the normal situation.

These two photographs were taken with the same conditions of light and background.

In 1907 I took a male with all the orange replaced by yellow. Specimens with the costa pale yellow and the abdominal stripe speckling orange are not very uncommon. In this, as far as I know a unique male, the costa is almost white, and the thoracic and abdominal stripe pale yellow. I have also one female with yellow instead of orange markings. For this yellow form *lutea* seems to be a suitable name.

This year I have received a specimen (fig. 3) with the black lines more obsolete than in any other I have seen. The discal spot is very distinct, and the costal stripe unusually deep orange.

In the last specimen (fig. 4) there is an almost complete fusion of the second and third lines, and the hind wings are very distinctly marked.

Figs. 3 and 4 are from photographs taken in bright daylight, but not, as figs. 1 and 2, in actual sunlight, and therefore appear less brilliant. All are somewhat enlarged.

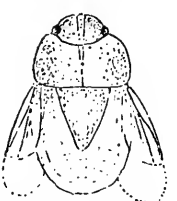
FOSSIL INSECTS FROM COLORADO.

By T. D. A. Cockerell. 1909a

Cydnidæ (Hemiptera).

Cydnopsis handlirschi, sp. nov.

Length, 6 mm.; breadth of thorax, 3½; breadth of scutellum at base just over 2 mm., its length fully 2⅓; width of head about 1¼ mm. Head and thorax densely and rather coarsely granulate; head broad, subtruncate in front, with the median lobe narrow; sides apparently excavated, and angular near the middle, but this is due



Cydnopsis handlirschi.

merely to the faintness of the large eyes, which in reality fill the excavation; sides of thorax broadly rounded; scutellum triangular, longer than broad, the lateral margins straight, the apex obtuse; corium moderately dense, membrane without visible veins; tibial armature not visible; antennæ not preserved.

In Scudder's table of American Fossil Cydnidæ ('Tertiary Insects of North America,' p. 437) this runs to *Cyrtomenus*. It shows much resemblance to *Cyrtomenus concinnus*, Scudd., from the Green River shales of Wyoming, but it differs greatly in the shape of the scutellum (very broad, and oblong rather than triangular in *C. concinnus*), the relatively smaller head, and the more convex profile of the lateral lobes of the thorax. In form and structure *C. handlirschi* is very close to *Pangæus bilineatus*, Say, which lives to-day in Colorado (it occurs at Boulder, and Judge Henderson has obtained it at Fossil Creek), but the *Pangæus* is a smooth shining insect instead of being dull and roughened. In every respect our fossil appears to accord well with *Cydnopsis*, Heer, described from the European Miocene. In several of Heer's species of *Cydnopsis* the sides of the scutellum are dis-

tinctly concave in outline, but in one or two they are virtually straight, as in ours. The sculpture of the corium in our insect is practically as in *C. tertiaria*, Heer, but the sides of the thorax in front are more rounded than in that species. In the shape of the head and thorax our insect closely resembles *Neurocoris rotundatus*, Heer.

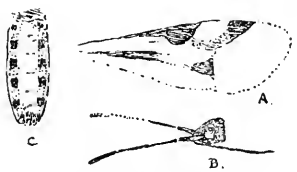
Hab. Eocene shales about six miles north of Rifle, Colorado, sent by Dr. S. M. Bradbury. Found at the same place as *Philorites*, &c.

The species is dedicated to the eminent authority on fossil insects and also on living Hemiptera.

Coreidæ (Hemiptera).

Jadera (?) interita, sp. nov.

Length about 6·5 mm.; breadth of abdomen about 1·65, of thorax about 1·75; antennæ 4·3 mm.; hind tibia a little over 3 mm. Head and thorax dark reddish brown; abdomen paler, with submarginal



Jadera (?) interita.
A. Hemielytron. B. Head with appendages. C. Abdomen.

quadrate spots, five on each side; antennæ and legs brown; hemielytra with a dark pattern as shown in the figure, but otherwise pallid, the membrane wholly invisible. Rostrum reaching to base of abdomen. Antennæ very slender, with a slender club; approximate length of joints in μ:—(1) 500. (2) 1360. (3) 1200. (4) 1100. Legs slender, the femora somewhat thickened; width of hind femora about middle 425 μ, of hind tibiæ at apex 187.

This resembles *Corizus guttatus*, Scudd., from the Green River shales of Wyoming, but in some material from Green River in the Museum of Yale University I have seen what I suppose to be *C. guttatus*, and it is certainly a different insect. The tegmina or hemielytra of *C. guttatus* (type) were not preserved, so it is impossible to say what pattern they may have had. The present insect is hardly a *Corizus*; the last antennal joint is too slender, and the hind tibiæ are too long and slender. *Jadera* (*J. hæmatoloma*, H. Schf.) agrees much better, even having a rather similar elytral pattern, but it is a broader insect than the fossil, with shorter legs.

Hab. Eocene shales about six miles north of Rifle, Colorado, sent by Dr. S. M. Bradbury. Found at the same place as *Eofulgorella*, *Philorites*, &c.

Fulgoridæ (Hemiptera).

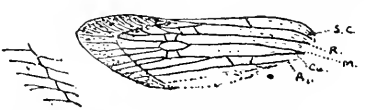
Eofulgorella, gen. nov.

A small Fulgorid, with comparatively elongate tegmina, the costa arched basally, but gently concave about the middle; outer margin very oblique. The venation is very well marked by dark lines, the veins being broadly pigmented. The homologies of the different veins in various genera of Fulgoridæ seem to be rather obscure, but as I interpret them in the present case, the venation is as follows: subcosta distinct from radius, ending on costa a little beyond the middle of the, and having one oblique branch to, costa; radius straight, branched terminally as shown in the figure; media branching beyond middle of wing, and enclosing a small fusiform cell; cubitus branching near middle of wing; two cross-nervures from cubitus to media, and two from cubitus to first anal, the latter before middle of wing; series of gradate veins in the subapical field very well marked, consisting of a series of oblique transverse veins, one following the other, between the longitudinal nervures.

I failed to associate this with any living or fossil genus, and so sent a sketch to Mr. E. P. Van Duzee, who kindly replied that it agreed with nothing known to him. It has a general resemblance to *Oliarus* and its allies, but is remarkable for the shape of the tegmen and the regularity of the gradate veins.

Eofulgorella bradburyi, sp. nov.

Tegmen about 8 mm. long and 2½ broad; with dark veins, and the apex broadly infuscated. No other parts preserved.



Eofulgorella bradburyi.

S.C. = Subcosta. R. = Radius. M. = Media. Cu. = Cubitus. A. = First Anal.

Hab. Eocene shales about six miles north of Rifle, Cororado; received from Dr. S. M. Bradbury. The locality is the same as that from which *Philorites* and other Diptera have been described.

Agrionidæ (Odonata).

Enallagma mortuella, sp. nov.

Head and thorax black; abdomen, at least as far as middle, warm red-brown above, pallid at sides, a ventral band and the sutures darker brown, no sign of any black saddles on the distal ends of the segments, such as are usually seen in modern species. Legs pale reddish, the femora at least largely black, the tibiæ with short black bristles, quite as in the living species. Wings clear, the veins black or almost; stigmata warm red-brown with heavy black margins, alike on upper and lower wings. Length of anterior wings 19 mm., nodus to centre of stigma 11 mm.; length of posterior wings 17½ mm.; eleven postnodal cross-veins in anterior and nine in posterior wings.

Upper side of quadrangle longer than inner; upper and lower sides of stigma subequal; base of subquadrangle (hind wing) nearly (a small fraction basad) even with the midmost point between antenodal cross-veins*; anterior cross-veins far apart, the cell they bound being over four times as long as deep, much as in the living *E. signatum* and *fischeri*; Cu_2 having its origin and course entirely as in *Enallagma* (consequently not as in *Telagrion*).

This will not go in either of Kellicott's divisions ('Odonata of Ohio,' p. 32), since both bands and spots referred to are wholly absent. So far as the colour of the abdomen goes, the species should be placed in *Amphiagrion*, but the generic characters of the tenth abdominal segment remain unknown. I cannot see any postocular spots or band, but am not quite positive that these were absent. The size agrees better with *Enallagma* than *Amphiagrion*.

Regarded as an *Enallagma*, the fossil would come nearest, by its coloration, to the little group of *E. signatum*, *fischeri*, and *pollutum*, and it is noteworthy that it also falls here by the shape of the cell bounded by the antenodal cross-veins. (*E. civile*, *hageni*, and *carunculatum* have this cell much shorter.)

The cells between the quadrangle and the level of the nodus are four in the anterior and three in the posterior wings; there are four cells between M_1 and M_2 before the doubling begins; the poststigmatal cells are four in the upper and three in the lower wings. The subnodus is very oblique. The brace-vein is distinct, and M_1 is conspicuously angled thereat. The lower side of the stigma is broad, bordering a trifle *more* than one cell; in most of the modern species it borders conspicuously *less* than one cell, but in the anterior wings of a female taken by Mr. G. L. Garlick at San Geronimo, New Mexico, belonging either to *E. annexum* or *calverti*, the stigma is as in the fossil. No doubt the longer stigma is a primitive character.

In my table in Amer. Journ. Sci., July, 1908, pp. 71–72, this runs to *Agrion mascescens*, Scudder, but it is smaller than that species, and differs in the position of the base of the subquadrangle. The difference in size can hardly be sexual, as the type of *mascescens* was a male. There is no doubt that it is very close to *mascescens*, and it may be that the difference is due to variation, but it seems preferable to treat it as distinct. The abdomen of *mascescens* is described as colourless.

Hab. Miocene shales of Florissant, Station 13 B, 1908 (George N. Rohwer).

Bibionidæ (Diptera).

Bibio atavus, sp. nov.

♀. Length about 10 mm.; wings 8¾; head, thorax, and legs black, the dorsum of thorax browner; abdomen dusky ferruginous.

* In Amer. Journ. Sci., July, 1908, p. 72, there is a short table relating to this character, but by some unfortunate accident "quadrangle" is printed in place of subquadrangle.

Wings mainly clear, but with the costal region broadly fuliginous, this narrowing toward the apex, but including the whole of the third vein; veins thick, dark reddish-brown. In venation this agrees with *Bibio* as figured by Williston (N. A. Dipt. p. 142, f. 4), except that the basal section of the third vein (from anterior cross-vein to first vein) is shorter, and the cross-vein between the fourth and fifth is a trifle longer. The hind femora are slender, and only about 2 mm. long.

The male, as in modern species, has swollen anterior femora. In this sex the dark colour of the wings appears to be redder and more suffused.

This is a perfectly typical *Bibio*, such as may be caught in Colorado to-day, even to the structure of the anterior legs in the male.

Hab. Miocene shales of Florissant, very abundant. The Bibionidæ from earlier American Tertiaries belong to the less specialized genus *Plecia*. I learn from Prof. Melander that a yellowish *Plecia* was collected in the Florissant shales by Scudder.

Bibio dubius, Bellardi, is later than the fossil *B. dubius* (Germar) Giebel, but as the latter was originally described (in 1837) under *Phthiria*, and is doubtfully a *Bibio*, the name of the Mexican species can probably remain.

Bibio gracilis, Walker, List Dipt. Brit. Mus. 1848, p. 123 (Canada and N. H.) is a homonym of *B. gracilis*, Unger, 1841. Walker's species may be called *Bibio slossonæ*, n. n., having been added to the United States fauna by Mrs. A. T. Slosson.

ON TWO UNDESCRIBED SPECIES OF *SCOLIIDÆ* FROM BORNEO.

By P. Cameron.

Discolia ornaticollis, sp. nov.

Black, the prothorax and scutellum rufous, the pro- and meso-notum covered with stiff, depressed, red hair; the scutellum and base of metanotum more sparsely with longer paler reddish hair, the hair on the head, pleuræ, apex of metanotum, abdomen, and legs white; the clypeus, except for a large black mark on the apical half and the mandibles, except at the apex, pale yellow. Abdomen distinctly bluish violaceous. Wings uniformly fuscous violaceous, the nervures black. ♂. Length, 8 mm.

Kuching, Borneo (John Hewitt, B.A.).

Front and vertex smooth; the metanotum in the centre strongly but not closely punctured; the sides are neither so strongly nor so closely punctured. Except for a black spot on the sides near the apex the prothorax is red. Apical abscissa of radius broadly roundly curved.

A distinct little species.

Tiphia punctifrons, sp. nov.

Black, the antennæ, tegulæ, four anterior legs, except the coxæ and the mandibles, except at the base and apex, red; wings hyaline, the stigma large, black, the costa and nervures testaceous; metanotum with three keels, and one on the basal half between the outer and central. Front strongly punctured, the punctures clearly separated; the face and clypeus opaque, more closely and finely punctured. Basal abscissa of radius roundly, broadly curved, longer than the second; the second recurrent nervure interstitial, the first received distinctly beyond the middle of the cellule. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

Sides of front punctured, but not so strongly as the apex; the centre above and the vertex smooth; the temples punctured. There is a crenulated border on the base of the mesonotum behind the keel; the rest of it and the scutellum smooth, except for some scattered punctures. The upper part of the propleuræ at the base narrowly, the lower broadly longitudinally striated. Mesopleuræ with scattered punctures. Metapleuræ longitudinally distinctly aciculated, the apical half from shortly behind the middle longitudinally striated. Apical half of abdomen opaque, densely covered with fuscous pubescence. Apex of clypeus slightly incised.

Allied to *T. borneana*, Cam., which may be known by the black four anterior femora, black alar nervures, longer first abscissa of radius, the second recurrent nervure not interstitial, &c. For a synopsis of the Bornean species of *Tiphia*, see my paper in the 'Entomologist,' 1907, pp. 288–289.

DESCRIPTION OF A NEW LASIOCAMPID MOTH FROM TURKESTAN.

By Oscar John (St. Petersburg, Russia).

(Plate V.)

Epicnaptera alice, nov. sp.

Male. Head, collar, patagia and thorax thickly and evenly covered with woolly, mouse-coloured hair. Palpi bushy, of a darker hue, forming together with the hair of the frons a muzzle-like prominence. Antennæ pectinate, yellowish brown. Abdomen dorsally in its proximal part haired as the thorax, distally, on the sides and on the under side covered with short ochreous hair. Legs mouse-grey, woolly-haired. Wings of the typical form, external margin even, hind wings undulated near apex only. General colour of fore wings same as of thorax, with a brownish tinge in the middle area. The pattern is much the same as in the other species of the genus, the inner and elbowed lines consisting of dark-brown dots. Stigma in cell distinct, dark brown. The pale subterminal line suffused, running straight from costal to inner margin and bordered outwardly with a dark shade. Hind wings of the same ground

colour, paler in the inner portion of the basal area and showing a pale suffused triangle extending from apex to anal angle, on which latter it rests with its base. Under side of fore wings coloured as the upper side in its outer area and yellowish-grey in the middle and basal areas. Transverse lines more or less distinct. Hind wings with their upper basal half dark, embordered by a curved dark-brown stripe or throughout of a dark-brown coloration; outer half as on the upper side, anal portion pale grey. Length of fore wing 12½ to 13 mm.

Three male specimens were captured by Mr. S. Malysheff near Baigacum, Syr-Darja, on April 17th, 20th and 21st, 1908. Two specimens are in my collection, and the third one was destroyed for dissecting purposes. Female unknown.

There is no doubt of this species being quite distinct from all others of the genus *Epicnaptera*, Rbr. known from the Palæarctic region, i. e. *ilicifolia*, L., *arborea*, Blöcker,* *tremulifolia*, Hb., *suberifolia*, Dup. and *glasunovi*, Gr. Gr. The fittest place in the system for this new species, which is the most divergent, would be after *glasunovi*, with which it has the almost even margin of the wings in common. *E. alice* differs from *glasunovi* not only in size, being considerably smaller, but also in coloration (*E. glasunovi* is orange-yellow).

I dedicate this new species to Miss Alice Tottien, of St. Petersburg.

DRAGONFLIES IN 1908.

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

During the season of 1908 very little of fresh interest was noted in connection with the British dragonflies. The season seemed late in commencing, the first dragonflies seen by myself being on May 17th. On that date I met with *Pyrrhosoma nymphula* at the Black Pond on Esher Common, Surrey, where also I saw a specimen of *Libellula quadrimaculata* hanging to its nymph-skin, at the time too weak apparently for flight. On May 24th at the same place *P. nymphula* and *Enallagma cyathigerum* were fairly numerous, and I captured a male *Cordulia ænea* in the same neighbourhood. Three days later I received from H. Hart a female *Libellula depressa* taken in a garden in the outskirts of Kingston-on-Thames. On the last day of the month a female *Pyrrhosoma tenellum* was captured at the Black Pond, this being an early date, for my previous earliest record seems to be June 9th.†

In the New Forest from June 9th to June 16th there were noticed at least:—*Agrion mercuriale*, both sexes; *P. nymphula* and *Calopteryx virgo*, numerous, and *L. depressa*, fairly so; *Orthe-*

* H. Blöcker, 'Revue Russe d'Entomologie,' viii. No. 2, 1908, p. 126.

† Mr. E. J. Hare took the species a day earlier, on the occasion of the excursion of the South Lond. Nat. Hist. and Ent. Soc. to Oxshott, May 30th, 1908.

trum cærulescens, very numerous, but seldom very blue in colour. *A. mercuriale* was in yet another new locality—near Holmsley. Search was made for *Gomphus vulgatissimus* in its known locality along one of the streams in the southern part of the Forest, without success: it was probably but just emerging, or there may not have been sufficient sun for it. Two empty nymph-skins were found, however, on the bank of another perfectly distinct stream, also in the south of the Forest.

On June 8th in the New Forest *O. cærulescens* and *P. nymphula* were found held in captivity by *Drosera intermedia*, one of the Sundews. Insects of this size are usually caught by the wings which become useless when smeared with the tenacious gum from the tentacles. These dragonflies were alive and could not, I suppose, have been employed as food by the plant, unless the tip of the abdomen or some other nutritious part had been near enough to the tentacles to be secured and attacked. No doubt such captured dragonflies would soon die of starvation. On August 19th, also in the Forest, an *O. cærulescens* was caught by the tip of a wing, but so tenacious was the gum that it had to struggle to escape.

During a week-end visit to Bedford (July 10th to July 12th) *Agrion puella* was found between Bromham and Kempston, and near Milton Ernest; while in the second locality *Ischnura elegans* was secured also.

On June 14th I received from H. Towell a living male of *Æschna cyanea* taken in Teddington, Middlesex. It was teneral in condition, but is worthy of note on account of the date, as even July 1st would be considered quite early for the species. It was captured indoors and was probably bred in the water of an old gravel pit close at hand. A specimen was taken on July 24th near Albury on the North Downs in Surrey. On September 9th I watched a male settle on the hedge-side at Shotover Hill, Oxon. The weather was so poor that the insect allowed me to approach and without any difficulty to take it with my fingers. Mr. N. P. Fenwick, Jnr., took one on October 18th near Esher Common, this being the last of which I heard—more than four months after the first. On July 25th H. Hart shewed me a female *Æschna grandis* taken in the Cemetery, Kingston-on-Thames.

In the New Forest, from August 1st to September 4th, the species noted were:—*Cordulegaster annulatus*, *O. cærulescens*, *C. virgo*, *P. tenellum*, *Platycnemis pennipes*, *A. mercuriale*, *Sympetrum scoticum*, *Lestes sponsa*, *I. elegans*, *L. quadrimaculata*, *Sympetrum striolatum*, *Æschna mixta*, *Æ. cyanea*, and *E. cyathigerum*.

In the autumn Esher Common and the Black Pond within its boundaries were several times visited with the following results:—September 5th, a poor day, *S. scoticum* common, *S. striolatum* a few, *E. cyathigerum* several, *P. tenellum* a few, also a few *Æschnæ*; October 4th, there were seen *P. tenellum*

one female, *E. cyathigerum* one male and one female, *S. striolatum* and *S. scoticum* very common, also an *Æschna* or two; October 11th, *E. cyathigerum* one male, *S. scoticum* very common, *S. striolatum*; October 18th, *S. striolatum* common, *S. scoticum* very common.

As regards late occurrences Mr. F. W. Campion tells me of the capture of a male *L. depressa* on September 7th at Chingford in Essex, and I took a male *L. quadrimaculata* on August 7th near Beaulieu River in the New Forest. My last dragonfly experience for the season was on November 1st when several *S. striolatum* were seen in the New Forest.

ON THE TRIMORPHISM OF *PYRRHOSOMA NYMPHULA* (Female).

By F. W. & H. Campion.

Two important variations from the normal decoration of *P. nymphula* (female) have been known to entomologists for many years, and at one time each form was accorded separate specific rank. In one of them (var. *fulvipes*) the black markings on the abdomen are greatly reduced in extent, and in the other (var. *melanotum*) they cover practically the whole of the dorsal surface.

Var. *fulvipes* (Steph.).

Agrion fulvipes is thus described by Stephens :—

"Sp. 11. fulvipes. *Sanguineum, nigro-æneo pictum, pedibus rufo-fulvis.* (Long. corp. 17 lin.; Exp. Alar. 24 lin.)

"Ag. fulvipes. *Steph. Nomen. 2d edit. col. 113.*

"Head brassy, front red, with two black streaks; thorax brassy above, with a slightly interrupted yellowish-red streak on each side, the sides themselves and beneath reddish-yellow, with brassy sutures; abdomen blood-red, the five basal segments each with two transverse brassy streaks at the apex, the remainder brassy above, with the sides and apex red; legs tawny-red; wings hyaline, stigma pale red. Sometimes all but the two basal segments of the abdomen are brassy above.

"Taken at Coombe wood, and near Ripley, in June."—Ill. Brit. Ent. vi. Mand. p. 75 (1836).

A practical interpretation of this description is afforded by a very immature female of *P. nymphula* contained in the Stephens Cabinet in the British Museum (Natural History); attached to it is the printed name "fulvipes *Step.*," and the well-known small oval ticket which distinguishes Stephens's own specimens.

Fulvipes varies a little in detail, but it may be separated from the normal female by the reduced markings on segments two, three, and four. On two the mid-dorsal black line is very weak, and the apical crown-shaped spot is replaced by a wide

bifurcation of the median line, but there is no connection with the circlet at the apical suture. Segments three and four are often similar to number two, but when, as sometimes happens, the median line is continued through the bifurcation to the circlet, an anchor-shaped spot is produced, the stock of the anchor being represented by the circlet. Segments one and five to ten appear to be normal and constant.

The legs of Stephens's specimen are, as stated in the description, tawny-red, and so are the legs of a more mature example of the same form taken at Folkestone by Mr. O. Thomas on May 15th, 1892, also in the Museum; but in all the other specimens which we have seen the legs are black, as in the teneral and adult states of normal males and females.

This form is quite common. An example from Folkestone has been already mentioned, as well as two Surrey localities given by Stephens. Mr. W. J. Lucas has shown us a specimen bred from a Surrey nymph in May, 1900, and another taken on Esher Common on June 10th of the same year. We have the form from Epping Forest (June 16th, 1907; June 14th, 1908; and May 9th, 16th, and 30th, 1909). The British Museum possesses a specimen from De Selys' Collection, and another from Germany presented by Mr. W. F. Kirby, and collected during July, 1887.

Var. *melanotum* (De Selys).

This uncommon form has been excellently figured by Mr. W. J. Lucas (Entom. 1901, pl. i. fig. 3), and more recently Mr. K. J. Morton has restored to it its Selysian name, which had been overlooked (*ibid.* 1908, p. 38). We observe from Mr. Lucas's paper on the Dale Collection (Ent. Mo. Mag. 1909, p. 82) that that collection contains at least one specimen of *melanotum*. Another example is in the Stephens Cabinet; it carries the usual oval ticket, and a printed label reading "Lincolniense *Step.*" It is probable that De Selys saw this insect when he consulted the Stephens Cabinet in 1845, for the following entry appears in the synonymy of *Agrion minium* given in his 'Revision of the British Libellulidæ,' published in the following year:—"*A. lincolniense*, Steph. Catal. and Ill. (partim: the young female)." The courtesy of Mr. Lucas has enabled us to compare with Stephens's specimen an example of *æneatum* taken in the New Forest on June 5th, 1900, with the result that the comparison has established complete agreement.

Agrion lincolniensis is set out in Stephens's 'Catalogue' as a separate species, thus: "3418. 9, Lincolniensis. *Dale MSS.*" As no description is given, of course the bare name cannot stand. Afterwards, in his 'Illustrations,' Stephens wrongly identified this distinct insect with *Agrion chloridion* (Charp.), and sunk the name *lincolniense* as a synonym of that species. But it is clear that the dragonfly to which Charpentier gave the name *chloridion*

was, in both its sexes, *Erythromma naias* (Hansem.). Indeed, when describing *melanotum*, De Selys perceived the danger of that form being confused with immature *E. naias* (female), and drew particular attention to the characters by which the two females were to be distinguished.

Stephens's confusion was perpetuated by Evans, and the figure of *Erythromma chloridion* (female) given in 'British Libellulinæ' (pl. 5, fig. 6), and stated to have been taken from a specimen in Stephens's Cabinet, may be regarded as representing, though very inadequately, the particular insect still in the collection.

It appears, therefore, that the synonymy of the variety stands thus:—

Agrion lincolniensis, Stephens, Syst. Cat. Brit. Ins. i. p. 307, no. 3418 (1829).

Erythromma chloridion, Evans, Brit. Lib. p. 16, pl. 5, fig. 6 (1845).

Pyrrhosoma minium var. female *melanotum*, De Selys, Bull. Acad. Belg. (2), xli. p. 1298 (1876).

Pyrrhosoma nymphula var. female *æneatum*, Lucas, Entom. xxxiv. p. 68, pl. 1, fig. 3 (1901).

Lincolnshire must now be added to the other known English localities, *viz.* Dorset and the New Forest. Extra-British localities which have been given are Madrid and the Sierra Albarracin, in Spain, and Corfu.

33, Maude Terrace, Walthamstow: June 1st, 1909.

DESCRIPTIONS OF FOUR NEW SPECIES OF *POMPILIDÆ* FROM SARAWAK, BORNEO.

By P. Cameron.

Pompilus lissonotus, sp. nov.

Black, very smooth and shining, primrose; the antennal scape, basal half of the flagellum and the under side of the fore femora dark rufo-testaceous, the palpi, more than the basal third of the hind tibiæ behind, and the spurs, white; wings hyaline, smoky from the base of the radius to the apex; the nervures black; the second cubital cellule oblique, of equal width; the first abscissa of the radius is almost double the length of the second, which is about one-fourth longer than the third; the first recurrent nervure is received near the base, the second at the base of the apical third of the cellule. The accessory nervure in the hind wings is received considerably in front of the cubitus. Calcaria white, the long spur of the hinder reaching close to the apex of the metatarsus. ♂. Length, 4 mm.

Kuching, Borneo, January (John Hewitt, B.A.).

Antennæ short and thick, covered with a short pile; the pedicel longer than wide, the third joint a little shorter than the following.

Eyes converging below; the hinder ocelli separated from each other by a distinctly less distance than they are from the eyes. Temples almost obsolete, the occiput transverse. Apex of clypeus transverse, with the sides oblique. Pronotum longer than mesonotum. The tibial spines are few in number; the tarsal are more numerous and shorter. Abdomen sessile, as long as the thorax.

Pompilus properans, sp. nov.

Black, the calcaria white; densely covered with silvery pile; wings hyaline, a triangular cloud along the transverse basal and transverse median nervures, the narrowed end above and the lower wider on the outer than on the inner side; a cloud filling entirely the radial cellule, the second and third cubital cellules and the space behind the first transverse cubital and beyond the third, the clouds at these obliquely narrowed in front, the apical part more irregularly than the basal; the cloud extends into the discoidal cellule along the second recurrent nervure, more widely behind than in front; the second abscissa of radius one-third longer than the third; the recurrent nervures received near the base of the apical fourth of the cellules; the accessory nervure in hind wings received distinctly behind the cubitus. The long spur of the hind tibiæ extends beyond the middle of metatarsus. Claws bifid, the inner claw thicker than the outer. ♀. Length, 6 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head distinctly wider than the thorax; the temples short; eyes converging above; the hind ocelli separated from each other by a very slightly greater distance than they are from the eyes. Tibial and tarsal spines longish.

Pompilus parvispinosus, sp. nov.

Black, smooth, shining, covered with a white primrose pile, the basal three abdominal segments red, the extreme base of the first, an indistinct transverse line shortly beyond the middle of the second, and a distinct one across the middle of the third, black; the apices of the fourth and fifth segments dark rufous; the palpi, mandibles except the teeth, the apex of the anterior coxæ below and the whole under side of the four posterior, the under side of the four anterior trochanters, and the apex of the posterior whitish-yellow; wings fuscous-violaceous, the posterior pair paler than the anterior, the nervures black; the second abscissa of the radius about one-third longer than the third, which is as long as the fourth; the first recurrent nervure is received shortly beyond the middle, the second at the apex of the basal fourth of the cellule; the accessory nervure in the hind wings is received shortly beyond the cubitus. Eyes converging above, separated there by the length of the third antennal joint. Hinder ocelli separated from the eyes by almost double the distance they are from each other. Apex of clypeus transverse, the sides obliquely narrowed. There is a narrow keel down the middle of the face. Temples almost obsolete, the occiput transverse. ♀. Length, 13 mm.

Matang, Sarawak, Borneo, December (John Hewitt, B.A.).

The apex of the anterior femora narrowly, of the intermediate more broadly, almost the apical three-fourths of the posterior except below, the four anterior tibiæ, except below, the basal three-fourths of the posterior above, and the greater part of the four anterior tarsi, yellowish-white; the spurs black, the longer of the posterior almost half the length of the metatarsus. The tarsal and tibial spines are numerous, black, and much shorter than usual. Scutellum flat. Base of mesonotum broadly rounded.

Salnis (*Myngynia*) *hirticandis*, sp. nov.

Black, the head above and below, the prosternum, fore coxæ, and ventral surface of abdomen covered with long black hair; the apical two abdominal segments densely with shorter fuscous pubescence, which becomes much paler towards the apex; wings dark fuscous, intersected with lighter spots; the apex with a fuscous hyaline border beyond the nervures; the third abscissa of the radius about one-fourth longer than the second; the second transverse cubital nervure is curved and angled at its junction with the recurrent; the third is irregularly, roundly curved outwardly; the second recurrent nervure is received shortly beyond the apex of the basal third of the cellule. Eyes slightly converging above, separated there by the length of the third antennal joint. Apex of labrum slightly, roundly incised in the middle, the sides at the incision roundly oblique. Apical joints of palpi fuscous. The tibial and tarsal spines stout. The long spur of the hind tibiæ extends shortly beyond the middle of the metatarsus. ♂. Length, 37 mm.

Kuching, Borneo, May (John Hewitt, B.A.).

The basal tooth on the claws is shorter and blunter than the apical. Temples short, broadly rounded. Hinder ocelli separated from each other by almost the same distance as they are from eyes. Antennæ stout, tapering towards the apex, the joints not clearly separated; the third not one-quarter longer than the fourth.

NOTES AND OBSERVATIONS.

Deferred Emergence of Eupithecia togata.—Although many species of Lepidoptera belonging to most diverse families are known in certain seasons, or even habitually, to pass more than one year in the pupal state, I am not aware whether this habit has before been noticed in the case of the "pugs." The following note may therefore be of interest:—In the winter of 1907, in response to an advertisement in this Journal, I purchased from a collector in Perth one dozen pupæ of the above species. The cocoons were placed in a breeding-cage kept in a lavatory in the house, and in 1908 nine imagos emerged on the following dates:—Two on May 24th, one on the 25th, two on the 27th, two on the 28th, one on the 29th, and one on the 30th. As no more emerged, I concluded that there had been a death-rate of 25 per cent. On clearing out the cage preparatory to a journey to Scotland last autumn (1908), I noticed that one of the pupæ, as seen through the partially opened cocoon, did not appear to be dead, so this and

all the others were returned to the cage, which was taken in August to Scotland, in September to Lyme Regis, and was brought back to London in October. No *Eupithecia* larvæ were taken by me last season. On May 9th of this year a very fine specimen of *E. togata* emerged and another, equally fine, on May 16th, two out of twelve having thus spent two years in the pupal stage. Whether the twelfth is dead or is deferring its emergence till 1910 remains to be seen. I do not know whether this is the usual habit of the species, or whether it is exceptional. The breeding-cage was kept indoors, and certainly would have been at a higher average winter temperature inside a house in London than the pupæ would have experienced in the pine-woods of their native home in Scotland, so the deferred emergence cannot be ascribed to refrigeration. — R. Meldola; 6, Brunswick Square, W.C., June 3rd, 1909.

The "Large Copper" Butterfly (Chrysophanus dispar).— As no accepted record exists of the occurrence of this species in Britain since 1848, I do not think I can be accused of acting in an unscientific manner by trying to re-introduce it through Continental specimens. I have, consequently (through the kindly help of Mr. J. W. Tutt), turned out a number of the larvæ of the "*rutilus*" form at Wicken Fen, and I ask the support of all entomologists to preserve specimens from capture for some years to come, in order to see if this beautiful species can be re-established. It will also be interesting to see if in the course of a few generations any reversion to the British form "*dispar*" might occur. I hear that an attempt is also being made to introduce the other "*dispar*" (*Lymantria*) at the same place, so British (?) records of this will also be valueless.—G. H. Verrall; Sussex Lodge, Newmarket.

The British Raphidiidæ.—Referring to Mr. Claude Morley's notes on the British species of *Raphidia* (Entom. June, 1909, pp. 141–3), I may say that *xanthostigma* is distinctly the commonest species of the genus in Yorkshire, and cannot in any way be called rare. In my own experience it is not at all uncommon in the Wharncliffe Woods, near Sheffield; and in the Wheatley Woods, Doncaster, one can almost always rely on beating it out any suitable day at the end of May, or early in June. I have specimens, too, taken in different years at Skipwith, near Selby, by the Rev. C. D. Ash. Outside our county, Mr. G. W. Mason has sent it to me from Wrawby Moor, Lincolnshire; and I have taken it in Chippenham Fen, Cambridgeshire, Of *notata* I have four fine specimens, all taken on the same day in Bishop's Wood, near Selby, its other recorded Yorkshire localities being York (R. McLachlan), and Haw Park, Wakefield. Outside our county I have taken it in the New Forest. Miss Alderson has sent me specimens from Sherwood Forest, Notts, where she finds it not uncommonly, and I have several from Gosfield in Essex, taken by the late Mr. Alfred Beaumont. Neither *cognata* nor *maculicollis* are as yet recorded for Yorkshire, but the latter has for so many years been known to occur in abundance in the Oxshott (Surrey) district, that it was a surprise to read that Mr. Morley regarded it as "apparently confined to the New Forest." —Geo. T. Porritt; Elm Lea, Huddersfield, June 12th, 1909.

The Rhopalocera of Java.—Publication of the first of a series of illustrated monographs on Java butterflies has been recently announced. It treats of the Pieridæ, and is by M. C. Piepers and P. C. Snellen, with the collaboration of H. Fruhstorfer. The publisher is Martinus Nijhoff, The Hague, Holland.

Notes on the Life-history of Capys Disjunctus. — Some years ago Mr. A. D. Millar, of Durban, Natal, discovered the above-named butterfly which has, I believe, since been described, although it does not appear in Mr. R. Trimen's book on the 'Butterflies of South Africa.' The egg is laid upon the outside of the pod of the plant *Protea hirta*. The young larva, which is nearly black in colour, after leaving the egg-shell, immediately bores into the pod, which is then green and soft, feeding and making a tunnel in a downward direction. There is not very much change in the colour of the larva, but as it increases in size it gradually becomes lighter. When full-grown it is about one inch in length, very fat, slug-like in shape, and very much resembles *Cossus ligniperda* in colour when about half-grown. Having made a hole for the escape of the imago it changes into a brown pupa inside the pod. Like many of the Lycænidæ, both the larva and pupa are nearly always found accompanied by small brown ants which do not in any way injure either. The butterfly emerges about ten to fourteen days after the change to the pupal state. The plant grows upon the sides and tops of hills about one thousand feet above sea-level at Pinetown, Natal, some ten miles from Durban, and I have no doubt at other places as well. Those plants growing near the top of the hills are most favoured by the butterfly, and very few larvæ were found in the pods near the base of the hills. The pods vary very much in size, and as the larva does not leave the one it first enters to go into another, this accounts for the great difference there is in the size of the perfect insect; the large pods producing fine large insects, and the small ones just the reverse, in fact, some of the former are double the size of the latter. I never found more than one larva in a pod, and by the time the larva is full-fed the part of the pod it is then feeding upon is as hard almost as any wood. When I first found these larvæ I opened several of the pods, took out the larvæ which I thought were going to pupate and put them in a chip box to do so. The following day I was very much surprised to find, first that the ants had found them out and got into the chip box (where they came from, I don't know), and secondly, that out of ten larvæ only four remained—the other six had bored through the box. The fugitives I found near the top of the wall of the room in which I rear caterpillars, and the ants up there with them. In spite of feeding in pods the larvæ are still ichneumoned, and I have bred a good number of these parasitic flies. I found in all about thirty larvæ, and in March last reared about twenty-four specimens; the remainder of the larvæ were ichneumoned.—J. F. Leigh, F.E.S; Durban, Natal, May 1st, 1909.

Short Duration of Egg-stage of A. ulmata.—On Tuesday, June 15th, I took *A. ulmata* plentifully. A female began laying ova in a glass-bottomed box late in the afternoon and during the evening.

I was, however, somewhat surprised to find on the following Monday morning that the greater number had hatched out. This certainly seemed a very short time for duration of the egg-stage—five and a half days.—(Rev.) J. E. Tarbat; Fareham, Hants, June 24th, 1909.

Occurrence of P. moneta.—For the last eight years I have looked out plants of *Delphinium* in this neighbourhood for traces of the larvæ of *P. moneta* without success. This month, however, I have found or had brought to me sixteen cocoons, so that the species is evidently still extending its range. It has been taken in the county for some years, but to my own knowledge not so far west.—(Rev.) J. E. Tarbat; Fareham, Hants, June 24th, 1909.

[This species has been recorded from the New Forest.—Ed.]

The Entomological Club.—A meeting was held at the Savage Club, Adelphi Terrace, on May 20th last, Mr. H. Rowland-Brown in the chair. Other members present were Prof. E. B. Poulton and Messrs. R. Adkin, T. W. Hall, G. T. Porritt. Among other visitors were the Honorary Members, Messrs. A. H. Jones and A. Sich.—R. South, Hon. Sec.

Errata.—Page 140, line 6, for "Crosley" read "Crosby"; line 23, for "pine or among sweet gale" read "June 1907, among sweet gale"; line 15 from bottom, for "*Graphiolitha*" read "*Grapholitha*." Page 141, line 1, for "*bilunaria*" read "*bilunana*."

CAPTURES AND FIELD REPORTS.

Eurymene dolabraria in Cumberland.—As there have been few records of this moth in the North of England, it may perhaps be of interest to record that I captured a specimen on the wing, on June 3rd, at Tarn Lodge.—George B. Routledge; Tarn Lodge, Headsnook, Carlisle, June 4th, 1909.

Gonodontis (Odontopera) bidentata ab. nigra in Surrey.—I have to record the capture, by myself, of a male *G.* ab. *nigra* (Prout) on May 31st, 1909. The specimen was at rest on the tarred fence surrounding Waverly Woods, Surrey. Is not this a record for Surrey? I have never heard of it being taken so far south. I see that Yorkshire and Lancashire are given as localities in 'Moths of the British Isles," series ii., p. 278.—Cecil Worssam; Hillside, St. Albans.

Argyrolepia schreibersiana in Cambridgeshire. — On June 3rd last I went into Cambridgeshire to look for some *A. schreibersiana*, but it was a very cold day, wind north-east, and I did not expect to do much good. After examining a great many trunks of elm, I was successful in taking two specimens, and was about to return home, when I came to a small whitethorn bush, which I beat for larvæ. To my great surprise and pleasure I found three *A. schreibersiana* at the first beating, and was successful in taking eighteen in all. The cold had evidently driven them into the bush for shelter. I think this is a record catch of this rare and pretty little Tortrix for one

day. — Robt. S. Smith, Junr.; The Laurels, Downham Market, Norfolk.

Palimpsestis (Cymatophora) octogesima in London District. —On July 11th, 1907, and again this year, June 13th, I had the pleasure of capturing this moth here; both specimens were taken at sugar, not on poplar trees.—M. F. Bliss; Coningsburgh, Ealing, W.

Celastrina (Cyaniris) argiolus in Middlesex.—I am glad to say that after an absence of six years *C. argiolus* has turned up again in our garden during the second fortnight of May, flying around the flowering holly-trees in some numbers. It appears also to have been generally common in this part of Middlesex, and I have seen several in the gardens of Woodridings, Pinner, and Eastcote, while just over the border, at Eastbury, in Oxhey Woods, it was appearing singly among the wild hyacinths on the 22nd. I may add that I have never seen an example of the autumn generation here, though we have plenty of flowering ivy. The common butterflies, *P. brassicæ*, *P. rapæ*, and *C. pamphilus* have never been so abundant in my recollection.—H. Rowland-Brown; Oxhey Grove, Harrow Weald, June 20th, 1909.

Panchlora nivea, L.—A specimen of this pretty cockroach was brought, in the beginning of this month, from Jamaica to Cupar, among bananas. It was exceedingly lively when I got it. One could not but admire how closely it was adapted to its environment. A little less than the "blackbeetle" of our kitchens, it was hardly thicker than a playing-card, of a pale green, with transparent tegmina of a lighter shade. It would be seen with difficulty in the crevices of the plant. The specimen has been identified by Mr. Grimshaw, of the Royal Scottish Museum, Edinburgh, where it is placed for preservation.—Henry H. Brown; Cupar Fife, June 19th, 1909.

SOCIETIES.

Entomological Society of London.—*Wednesday, May 5th*, 1909. —Dr. F. A. Dixey, M.A., M.D., President, in the chair. — Mr. S. A. Neave exhibited three specimens of a remarkable Œstrid fly belonging to the genus *Spathicera*, Corti, captured on the carcase of a rhinoceros shot by him near Fort Jameson, N.E. Rhodesia, in February, 1908. He pointed out the extreme rarity of individuals of this genus in the imago state, though Œstrid larvæ had long been known and frequently recorded in the intestinal canal of *Rhinoceros bicornis*, and recently Prof. Sjöstedt had succeeded in rearing one individual from a larva, described by him under the name *Meruensis*. This seemed also to be the first recorded occasion on which the adult insect had actually been observed to be following the rhinoceros, and it was of some interest in this connection that both sexes were represented (two males, one female).—Mr. H. St. J. Donisthorpe brought for exhibition examples of *Formica exsecta*, Nyl., from Parkhurst Forest, Isle of Wight, and from the same locality *Dinarda hagensi*, Wasm., hitherto only observed (with the same ant) in Britain at Bournemouth by the

exhibitor; also *Tetramoferia donisthorpei*, Kieffer, n. sp., and *T. femoralis*, Kieffer, n. sp., taken by himself with *Tetramorium cæspitum*, L., at Whitsand Bay, Cornwall; *Paracletes cimiciformis*, taken with *T. cæspitum*, L., at Barnes Head, Cornwall; and *Antennophorus pubescens*, Wasm., a species new to Britain, taken on *Lasius flavus* at Whitsand Bay. — Mr. W. E. Sharp exhibited examples of the following Coleoptera from the West of Ireland to illustrate the prevalence of colour variation in that region:—*Carabus nemoralis*, Müll., *C. granulatus*, L., *C. arvensis*, F., *Notiophilus aquaticus*, F., *N. biguttatus*, L., *Leistus ferrugineus*, L., and *Corymbites cupreus* var. *æruginosus*, F.—Mr. H. St. J. Donisthorpe also showed three melanic forms of *Carabus nitens*, *C. arvensis*, and *Pterostichus dimidiatus* from the New Forest; all quite black.—Mr. Sharpe, explaining his exhibit, said that in his opinion these dark forms were racial, and represented the survival of an older race, and that the melanism was not due to protective necessities, derived from the environment of the localities in which the several species existed. — Mr. H. Rowland-Brown exhibited a series of *Pieris manni*, Mayer, from Le Vernet, Pyrénées-Orientales, and called attention to the superficial differences which presented themselves when compared with imagines of *P. rapæ*.— Mr. E. C. Bedwell exhibited a series of *Cassida fastuosa* taken by him on Box Hill, Surrey, mostly from the leaves of young foxgloves.—Dr. G. B. Longstaff exhibited a series of thirty-three specimens of *Danaida chrysippus* taken by him in Egypt and the Sudan during January and February, 1909. Two taken at Cairo, one at Kom Ombo, and one at Aswân were all typical, but somewhat dark. A few other specimens were seen at each of these localities, but none of them had white hind wings. At Khartûm, where the butterfly was fairly common, twenty-five specimens were taken; of these two might be described as typical, though lighter than the Egyptian specimens; in eight the veins near the middle of the hind wings were dusted with white scales; in seven the centre of the hind wings was more or less white, as in Moore's *alcippoides*; while seven might be described as typical *alcippus*, Cram. One specimen only was seen of the form *dorippus*, Klug, and this had the hind wings almost entirely white— f. *albinus*, Lanz. So far as could be estimated in the field, three-fourths of all the specimens seen at Khartûm were either *alcippus* or *alcippoides*. On the White Nile between El Duêm and Gebel En (lat. 14–12½° N.) four specimens were taken, three typical or nearly so, one of the *alcippus* form. These figures are in marked contrast to the proportions found by the President among Mr. Loat's captures on the White Nile in lat. 11–4¾° N.—Mr. T. Bainbrigge Fletcher, R.N., exhibited two mimics of *D. chrysippus*; the females of *Elymnias undularis*, and of *Argynnis hyperbius* (*niphe*), whose males in both cases show the ordinary coloration of the genera to which they belong. He said that although in the ordinary preserved condition the resemblance of these two females to *Danaida* was rather "rough and ready," and by no means comparable to the close imitation of pattern seen in the female of *Hypolimnas* (also exhibited), yet under natural conditions of flight the likeness between model and mimic was exceedingly close and deceptive. — Mr. Fletcher also exhibited specimens of a large and conspicuous Mydaid fly, *Mydas ruficornis*,

Wied., which show a striking resemblance when on the wing to the large and powerfully armed Scoliid wasps so common throughout Ceylon; a red spider found on a "bilimbi" tree (*Averrhoa bilimbi*); some newly-hatched Mantids closely resembling, both in colour, size, and the quick jerky movements, the common leaf-nesting ant, *Oecophylla smaragdina*; examples of a small Pyralid moth, *Syngamia floridalis*, when flying exactly like a Coccinnellid beetle; and a yellow-spotted Reduviid bug, *Acanthaspis quinquespinosa*, Fabr., an interesting case of warning coloration common to various Carabid beetles found in the same locality and situations (under logs, &c.).

Wednesday, June 2nd, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair. Mr. Frank Price Jepson, of Pembroke College, Cambridge and Thanet Lodge, Bromley, Kent; Mr. Ernest Charles Chubb, of the Rhodesia Museum, Buluwayo, South Africa; Mr. John F. Musham, of 53, Brook Street, Selby, Yorkshire; and Mr. Oscar Cecil Silverlock, of "Allington," Burbage Road, Herne Hill, S.E., were elected Fellows of the Society.—Mr. Selwyn Image exhibited an example of the North American sawfly, *Sirex caudatus*, Cresson, bred from a larva found at Highbury in a piece of wood, together with photographs of the larva and its galleries by Mr. Hugh Main.—The Rev. G. Wheeler brought for exhibition a series of *Anthocharis tages* var. *bellezina* from Aix-en-Provence taken this year, and of *A. belia* from the South of France for comparison; also a series of *Lycæna corydon* with dark under sides—the typical form in the south.—Lord Walsingham showed two set examples and pupal cases of *Holocacista rivillei*, Stn., called by the late Mr. Stainton "The lost Pleiad," because originally described in 1750 and not again found before 1870, mining leaves of the grape-vine.—Dr. T. A. Chapman exhibited specimens of *Callophrys avis*, a new species from the South of France, first taken by him at Hyères three years ago, and in the following year, and now obtained by him this year from the Pyrénées-Orientales; and two examples of *Pararge ægeria* from Southern France, with a typical Southern specimen (*ægeria*) and an English one (*ægerides*), for comparison, the French form being as far from *ægeria* in one direction as *ægerides* is in the opposite, and possibly a Mendelian variety.—Dr. T. P. Lucas, who was present as a visitor, brought for exhibition a box containing thirty-one species of butterflies taken by him in the neighbourhood of Durban in two hours. He also gave a short account of the abundance of Lepidoptera at Brisbane, Queensland.—Mr. E. C. Bedwell exhibited examples of the myrmecophilous beetle, *Hetærius ferrugineus*, Ol., from Boxhill, a species not recorded from Britain for forty-six years.—Mr. H. St. J. Donisthorpe, specimens of *Formica exsecta* (one female and two hermaphrodites) from Aviemore, pointing out that it had never been recorded from Scotland or the North before; specimens of *Formica rufa-pratensis* (two females and two hermaphrodites), pseudogynes and micrergates, from Nethey Bridge, Inverness-shire, remarking that this was the dominant form there.—Mr. L. Doncaster, a drawer of *Abraxas grossulariata* and its var. *lacticolor*, illustrating breeding experiments, which showed that *lacticolor* is a Mendelian recessive to *grossulariata*, and that the sex-determinants also behave as Mendelian characters, femaleness being dominant; and that males are homozygous (pure)

in respect of sex, females heterozygous.—Mr. J. R. Tomlin, examples of *Micropeplus cælatus*, Er., taken on marshy ground last April, near Cloghane, Co. Kerry, by Dr. Norman Joy and himself, an interesting addition to a small genus, so far reported only from Germany and Sweden.—Dr. G. B. Longstaff, a number of specimens of *Coccinella* 11-*punctata*, L., from the White Nile, taken during a migratory flight which lasted from 4.50 p.m. till nearly 6 p.m.; also a *Scarabæus* taken by him on the edge of the desert, within half a mile of the Sphinx, belonging to the Arabian species *S. compressicornis*.—Prof. E. S. Poulton, F.R.S., made the following exhibits:—(*a*) a beautifully carved scarab of about the sixth century B.C., from Upper Egypt, apparently copied from *Scarabæus sacer*; (*b*) species of two different genera of *Coccinellidæ* taken *in cop.* at Tubney, Berks; (*c*) a collection of Diptera from Oxford and the New Forest, with observations and captured by Mr. A. H. Hamm; (*d*) an example of the rare Castniid moth, *Castnia therapon*, Kollar (a Brazilian species) taken flying in his conservatory at Broadstone, Dorset, by Dr. A. R. Wallace, F.R.S.; (*e*) a series of forty-nine females and seven males of *Hypolimnas misippus* from British East Africa, to illustrate the heridarity tendencies of the female forms; (*f*) examples of Müllerian mimicry in *Euplœinæ*; (*g*) and a collection of small moths captured at sea, one hundred and ninety miles from, and south-east of, the Cochin China coast, sent to him with a short note by Mr. F. Muir and Mr. J. C. Kershaw, Fellows of the Society. Prof. Poulton then made some observations on the use of the saw of the sawfly during oviposition, supplementary to the discussion on the subject at a previous meeting, and also communicated "Notes on the Life-History of *Aulacodes simplicialis*, Snell," by Mr. Muir and Mr. Kershaw.—Mr. T. Bainbrigge Fletcher exhibited a collection of Lepidoptera common to the African, Indian and Australian regions, some of them occurring in America also, and remarked that it was incredible that, being extremely variable, they should retain their specific facies over the wide area of distribution in the absence of some fairly constant syngamic connection. He also showed a collection from Ceylon of black ants and their mimics; a mass of the Cingalese bug, *Dysderus cingulatus*, resembling a flower; and an example of the Coprid beetle, *Scarabæus gangeticus* taken on the wing carrying small winged Diptera of the Borboridæ. He suggested that the flies were rather passengers in search of their pabulum than parasites.—Mr. Hamilton H. Druce, F.L.S., communicated a paper "On some new and little-known Neotropical Lycænidæ."—Mr. Claude Morley, F.Z.S., communicated "A Description of the Superior Wing of the Hymenoptera, with a view to give a simple and more certain Nomenclature to the Alary System of Jurine."—Mr. H. St. John Donisthorpe, F.Z.S., read a paper "On the Colonization of New Nests of Ants by Myrmecophilous Coleoptera."—Mr. F. Enock, F.L.S., read a paper on "New Genera of British Mymaridæ (Haliday)."—H. Rowland-Brown, M.A., *Hon. Secretary*.

The South London Entomological and Natural History Society.—*May 13th*, 1909.—Mr. Alfred Sich, F.E.S., President, in the chair.—Mr. F. Coulsden, of Stoke Newington, was elected a member.

—Mr. Ashdown exhibited a bred series of *Spilosoma mendica*, from the New Forest, one female having the spots enlarged and with a tendency to coalesce into transverse fasciæ.—Mr. Buckstone, a specimen of *Bithys quercus* var. *bella*, taken at Oxshott, July 24th, 1908. —Mr. Joy, a living larva of *Hipparchia semele*, pointing out its protective habit of resting among dry bases of grass-stems.—Mr. Newman, living larvæ of *Dryas paphia*, *Argynnis adippe*, and *A. aglaia*, and a very large example of *Chrysophanus dispar*.

May 27th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Ramsey, of Kew, was elected a member.—Dr. Chapman exhibited two very extreme forms of *Pararge ægeria*, in which the fulvous areas were much enlarged. They were taken at Amelie les Bains.—Mr. Edwards and Mr. Carr, living specimens of *Cucullia chamomillæ* from south-east London.—Mr. Smith, a melanic specimen, var. *haggarti*, of *Tæniocampa pulverulenta* (*cruda*) taken at Dover in April. —Mr. Edwards, larvæ of the stag-beetle (*Lucanus cervus*) found in some rotting wooden palings on Shooter's Hill.—Mr. Newman, an unusually extreme melanic female of *Spilosoma fuliginosa* bred from Sheffield.—Mr. Sich, a peculiar aberration in the scaling of *Eupithecia castigata*.—Mr. West (Greenwich), specimens of the rare Coccinellid *Halyzia 16-guttata*, taken in the New Forest by Mr. Ashby and himself, and a series of *Cassida fastuosa* taken in some numbers by Mr. H. J. Turner, at Box Hill, on *Inula conyza*.—Mr. Lucas read a paper entitled, "The Scotch Fir (*Pinus sylvestris*)," and illustrated his notes with a large number of lantern slides made from his own photographs, with a few slides of microscopical details by Mr. F. Noad-Clark.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society. — *April 19th*, 1909. — Mr. R. Wilding in the chair. — A lecture was delivered by Mr. R. Newstead, M.Sc., on the "Natural History of Jamaica," with especial reference to the insect fauna of the island, notably certain pests allied to the Insecta which had been particular objects of study, *viz.* the cattle ticks. The lecture was fully illustrated by lantern-slides, and by specimens brought back by Mr. Newstead. The results of the expedition, due to the initiative and support of Sir A. L. Jones, will be fully reported upon officially.—Dr. Tinne exhibited a series of *Cœnonympha typhon* from various localities to show the range of variation in the species.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

City of London Entomological Society.—*March 16th*, 1909. —Mr. A. W. Mera exhibited *Stauropus fagi*, taken at Hammersmith in 1863. — Mr. A. J. Wellsdon, *Camptogramma fluviata*, bred from Bournemouth female, including many examples with interrupted fascia.—*Discussion.* Dr. T. A. Chapman opened a discussion as to the cause of the scarcity or absence of a species (of Lepidoptera) that sometimes follows a period of exceptional abundance in some particular locality. The opener advanced as a possible explanation the theory that abnormal abundance might be due to the temporary inactivity of some selective and destructive force; comparatively unprotected individuals would thus be allowed to

escape, and their unprotectedness would be transmitted to and accentuated in subsequent broods. Thus, when the selective agency again became active, the race would be exceptionally vulnerable to its attacks, and the species would be nearly exterminated until it was gradually selected up to the average of its protective potentiality, and its normal numbers so re-established.—S. J. Bell, *Hon. Sec.*

RECENT LITERATURE.

1. *Note on the Classification of the Dermaptera.* By M. Burr, B.A. 1 pl. (Deutsche Entomol. Zeitschr. 1909.)

Mr. Burr asks for criticisms of this scheme of classification.

2. *Neurópteros nuevos de la fauna ibérica.* By R. P. Longinos Navás, S.J. 1 pl. (Actas y Memorias del Primer Congreso de Naturalistas Españoles, 1908.) Zaragoza. 1909.

Eleven new species of Neuroptera (wide sense) are here described.

3. *Mantispidos nuevos.* By R. P. Longinos Navás, S.J. Barcelona. 1909.

Fourteen new species of this interesting family of Neuroptera (restricted sense) are characterized in this paper from 'Memorias de la Real Academia de Ciencias y Artes de Barcelona.'

4. *Report of the Entomological Society of Ontario, 1908.* Toronto. 1909.

This report of one hundred and fifty-two pages, with a number of illustrations, contains a mass of entomological lore, chiefly having to do with the economic side. There is an article on gall-insects by T. D. James, illustrated by plates A—R and figures in the text.

5. *Christ's Hospital Natural History Society Report for 1908.* Horsham. (Some notes and records are embodied.)

Judging by this report the Society is in a flourishing condition. Its motto, "In Natura Deus," will appeal to the genuine lover of Nature.

6. *Ants found in Great Britain.* By H. St. J. Donisthorpe, F.Z.S., F.E.S. 1908.

This is a paper read before the Leicester Literary and Philosophical Society, in which the author gives short interesting notes on the appearance, habits, distribution, and so forth, of the British ants, including introduced species. As Mr. Donisthorpe has taken all the British ants, he is able to speak with authority on these interesting insects. The paper will be of the greatest value to students of our Hymenoptera.

——— W. J. L.

Proceedings of the South London Entomological and Natural History Society, 1908–9. With four plates. Pp. i.–xvi., 1–110.

The publication of this excellent little annual is always awaited with interest, and its advent welcomed, not only by the members of

the Society but by many students in entomology and other branches of natural history.

Numerous items of importance are to be found in the abstract of the business transacted at the meetings, which are held in the evenings of the second and fourth Thursdays of each month throughout the year.

The wide range of subjects engaging the attention of the members is well illustrated by the five papers printed in the present volume. These are:—"Effects of Physical and Chemical Agencies on Lepidoptera" (H. S. Fremlin, M.R.C.S., F.E.S.); "House Moths" (A. Sich, F.E.S.); "Notes on Hungarian Butterflies" (A. H. Jones, F.E.S.); "Insects as Carriers of Disease" (H. S. Fremlin, M.R.C.S., F.E.S.); "Orchids and their Cultivation" (W. J. Kaye, F.E.S.). In addition to various other matters of interest adverted to by the President (Mr. A. Sich) in his address is an exceedingly able discourse on the antiquity of natural history study.

A Survey and Record of Woolwich and West Kent. Edited by C. H. Grinling, T. A. Ingram, M.A., LL.D., B. C. Polkinghorne, B.Sc., F.C.S. (the late), and others. Pages i–viii and 1–526. Woolwich: Labour Representation Printing Co., Ltd. 1909.

This volume is the result of a remarkable effort of local co-operation in scientific study. The South-Eastern Union of Scientific Societies having accepted an invitation to hold its Twelfth Annual Congress in Woolwich, in June, 1907, a local Committee was formed, and it resolved to commemorate the Congress by making a series of surveys of the district and publishing them as a local scientific handbook. This resolution has been carried out by the united labour of a large number of workers, and the surveys form an invaluable book of reference to local students of natural history.

The Geological Section, pp. 3–30, is edited by W. Whitaker, B.A., F.R.S., F.G.S.

The Botanical Section, pp. 31–230, is a Flora of Woolwich and West Kent, edited by J. F. Bevis, B.A., B.Sc., and W. H. Griffin. More than two thousand species are recorded, with notes on the nature of the habitat and actual localities where found, with dates. More than half the entries appear here for the first time, and several new county records have been established.

Mr. J. W. Tutt, F.E.S., has edited the Zoological Section (pp. 231–440). In this part the annotated list of Coleoptera runs to 53 pages, and comprises over 1200 species; whilst the list of the Lepidoptera, with localities, &c., extends to 87 pages. Of Hemiptera, 223 species of Heteroptera and 150 of Homoptera are entered; this list is founded on the work of Mr. W. West, of Greenwich. Owing apparently to a dearth of observers in the past, some orders of the Insecta are not mentioned, and Neuroptera is only represented by 8 species of Odonata.

There is also a section on Archæology, a Survey of the Scientific Industries along the Thames from the Ravensbourne to the Darenth, and a note on Woolwich as a Centre for Photography.

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ORTHOPTERA IN 1908.

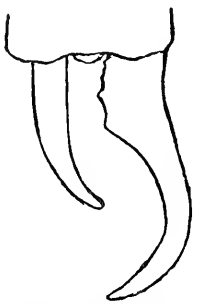
BY W. J. LUCAS, B.A., F.E.S.

BUT little of special interest seems to have come under observation during 1908 in connection with the British Orthoptera. All we can say is that we have obtained a little more information as to the range of the species, and that some additions, also slight, have been made to our knowledge in regard to their habits.

EARWIGS.—On August 10th three specimens of *Labidura riparia*, one being a large male, were captured four or five miles from the spot on the shore near Bournemouth where they are usually found, and on August 12th Mr. A. H. Hamm obtained a specimen at a spot between these two localities. In life these earwigs are of a dirty cream tint, with a little darker colouring in places, and therefore are extremely well hidden from casual observation by their resemblance to the pale yellow sand which fringes the shore. They do not, however, lay themselves open to detection, as they remain in hiding during the day. One of those captured on August 10th was set free, when it ran very rapidly over the sand and soon found a crevice in which to hide. Feeding of course takes place at night. The large male, as well as the third one mentioned above, were kept alive under observation, being fed on animal food. The male ate rapidly off a small portion of kipper given it, and was equally satisfied with whiting. It fed freely also for a time off a fragment of rabbit. Although it attacked white of egg, it appeared to have no great liking for it. On my return they were taken to Kingston, but on September 27th the large individual was found to have almost entirely consumed the smaller one, although they had been living together for some time. In November the survivor paid a visit to South Woodford for a week or two, Mr. Main wishing to obtain its portrait. At the beginning of December it did not appear to be feeding. When food was placed in the box with it no movement was made at first, but in one to two minutes it roused itself, waved its antennæ, turned towards and then

approached the food, apparently being always perfectly certain with regard to the direction in which it lay. After living in captivity over four months it succumbed during the Christmas season.

In September Mr. J. R. le B. Tomlin bottled for me a couple of *Labia minor* at Ledbury, in Herefordshire, but unfortunately a beetle ate them. On the occasion of the South London Society's excursion to Oxshott, on September 19th, Mr. W. J. Ashdown found a dead male, and during the Fungus foray of the same Society to Oxshott, on October 3rd, Mr. S. R. Ashby obtained another male. On September 30th Mr. F. M. Dyke captured a male which settled on his hand as he was walking along Southwark Street, near Blackfriars Bridge (*vide* vol. xli. p. 273).



Abnormal callipers of *F. auricularia* (× 10).

Forficula auricularia, the common earwig, seems to be somewhat subject to deformity in its callipers, and one so affected, taken in a garden at Teddington, Middlesex, seems of sufficient interest to be figured. The right branch of the callipers is normal, of the small rounded type; the left is simple, and gives one the impression that the base of it is within the creature's abdomen.

Cockroaches.—Two dark examples of *Ectobia panzeri* were found on breaking up a decayed tree-stump by the side of Beaulieu River, in the New Forest, on August 14th, and Mr. E. C. Bedwell gave me a female of this species, taken at Deal in August, which had its legs pale except for the knees and parts of the tarsi. On February 17th I received from Mr. H. Bradshaw a lively specimen of *Rhyparobia mederæ*, taken the same day in a greengrocer's shop in Berrylands Road, Surbiton. It was found in some sea-kale beneath bananas which came from the Canary Islands. From Mr. G. T. Lyle I received a specimen of *Leucophæa surinamensis*, which was found crawling about on Christmas Day in a hothouse at Bishopstoke, Hants. Is this cockroach to become a pest in warm plant-houses in this country?

Locustids (long-horned grasshoppers).—On August 18th, in the New Forest, some wood-ants (*Formica rufa*) were trying to carry away so large an insect as *Leptophyes punctatissima*. Could they possibly have succeeded?

Mr. Tomlin obtained *Meconema varium* in his sweeping-net at Streatley on October 2nd. It was obtained from a fence in Fassett Road, Kingston-on-Thames, September 13th, and was captured on the South London Society's excursion to the Oxshott district on September 19th. The female of a pair taken on this

date and put into a box without food ate a great part of the male, but whether the latter had died first I cannot say.

Mr. M. Burr tells me that he took the far from common species, *Xiphidium dorsale*, in a swamp near Eastry, Kent, on July 26th. A female *Locusta viridissima* was taken on the cliff-side near Swanage on August 17th. Mr. H. Campion tried very hard to find the scarce *Platycleis roesellii* at Herne Bay, but was not successful.

Acridians (short-horned grasshoppers).—On September 13th I paid a visit to Bookham Common in search of *Gomphocerus rufus*, this being the only locality for it with which I am personally acquainted. A few of both sexes were obtained in one spot, but not without a considerable amount of search.

G. maculatus, one of the earliest grasshoppers to become mature, I captured first at the Devil's Punch Bowl, Hindhead, Surrey, on June 24th. Mr. Tomlin took it at Tubney, Berks, on July 5th.

Stenobothrus bicolor was obtained at Sharnbrook, Bedfordshire, on July 11th; on a cliff-side near Swanage on August 17th; on Shotover Hill, near Oxford, on September 9th; in Middlesex, near the Thames side opposite Surbiton, on September 14th; and latest on Esher Common, Surrey, on October 11th. Mr. Tomlin took it in August at West Malvern, in Herefordshire.

S. parallelus occurred on a cliff-side near Swanage on August 17th; Mr. Tomlin took it at West Malvern in August. It was found on Shotover Hill on September 9th, and a single female was met with as late as October 31st in the New Forest.

A mature male *Mecostethus grossus* was taken in the New Forest on August 1st, but I do not think I noticed a female till August 21st.

One specimen of the scarce *Tettix subulatus* was secured on August 12th by the side of a pond near Holmsley, in the New Forest. The common species, *T. bipunctatus*, Mr. Tomlin took at West Malvern in August, and I took one in the New Forest on November 1st, this being my last grasshopper captured during the season of 1908.

ON THE PERPENDICULAR DISTRIBUTION OF THE PAPILIONIDÆ IN THE HIMALAYAS.

By W. Harcourt-Bath.

When in the spring of 1897 I availed myself of the opportunity of visiting the South-eastern Himalayas in pursuit of insects of various orders, I found the Papilionidæ so much in evidence, both as regards the number of species and individuals, that I decided to specialise upon this magnificent family of Lepidoptera, and the study of their vertical or perpendicular distri-

bution, as hitherto, constituted the pivot upon which I based my observations and particular line of inquiry. Although the Himalayas, according to geographers in general, consist of five principal parallel chains or ranges, two of which are situated upon the plateau of Thibet, for zoological and botanical purposes they are usually considered as including only that particular portion known as the central or meridional ridge, on the austral or Indian side of the high Asiatic tableland, together with its numerous spurs and continuations to the south. On the extreme western side the range is bounded by the Indus, where it makes a sudden bend and debouches into the plain, while on the east it terminates at the romantic gorge of the Brahmaputra or Tsangpo. Within these well-defined limits, which extend for about fifteen hundred miles in length and vary from one hundred to two hundred miles in width, the number of species of Rhopalocera possibly falls not far short of one thousand. Of this number, indeed, nearly six hundred and fifty different species have already been recorded from Sikkim and Western Bhutan alone, as many as six hundred and thirty-one having been particularised in the admirable "List of the Butterflies of Sikkim," by the late Lionel de Nicéville, in the 'Gazetteer of Sikkim,' published at Calcutta in 1894; while at least seventy additional species have been enumerated from the North-western Himalayas.

Of the family under consideration in the present paper fifty-two species are included in the above list by de Nicéville as inhabiting the circumscribed district named, while at least five others are known to occur in the Himalayas to the west of Nepaul, this interesting intervening country at present being a *terra incognita* to the entomologist. The latter remark also applies to the continuation of the chain to the east of Sikkim, namely, in Bhutan and South-east Thibet, where the Lepidoptera fauna will be found, in my opinion, to approximate more closely as regards the purely tropical element with the lower woody, hilly districts to the south of the Brahmaputra in Assam. When these countries are explored entomologically I have no hesitation in saying that the number of Papilionidæ occurring in the entire range of the Himalayas will be eventually increased to quite seventy. The number enumerated in the preceding catalogue as occurring in Sikkim, alone, far exceeds that existing elsewhere in anything like the same area, not only in the remaining portion of the excessively rich Indo-Malayan region, to which the Himalayas principally belong, but as regards the still richer lepidopterological fauna of the neotropical region in South America. For although collectively exceedingly rich in Papilionidæ, as well as in other families of Rhopalocera, all the larger islands of the East Indian Archipelago belonging both to the Indo-Malay and Austro-Malay sections, situated either directly under the Equator or in close proximity thereto, upon

either side, can, individually, rarely produce more than from one to two dozen species—that is, from twenty-five to fifty per cent. less than is the case in the small Sikkim section of the South-eastern Himalayas. Even in the comparatively well-known and much more extensive continental district of the Malay Peninsula the number of species belonging to this particular family, as recorded by Mr. W. L. Distant in his excellent work on the 'Butterflies of the Malay Peninsula,' falls short of the number inhabiting the very circumscribed area of Sikkim by fourteen. And what makes this fact the more remarkable still is that the latter district is situated not only remote from the Equator, but is wholly outside the Tropics besides. This singular superfluity of species, however, is shared by all the other families and sub-families of Rhopalocera, with the exception of the smaller statistically and more strictly equatorial Euplæinæ, Elymniinæ, Morphinæ, and Nemeobiinæ. In short, as the late lamented Mr. Lionel de Nicéville remarked to me upon the occasion of a visit which I paid to him at the Indian Museum in Calcutta, "Nowhere else in the Eastern Hemisphere will one find butterflies so abundant either in species or individuals."

In some measure this is to be accounted for by the continuous succession of phytogeographical and climatal conditions produced by the temperature and precipitation at different levels, at least as regards the number of species is concerned, and provides a somewhat parallel case to the conditions which exist in the Alps of Central Europe, the species becoming similarly less numerous as one recedes therefrom upon either side. But as regards the overwhelming number of individuals of many species to be met with in the South-eastern Himalayas another set of factors apparently comes into play. Without, however, entering here into a discussion as to the cause or contributory cause of the latter remarkable phenomena, I will just venture the remark that in my opinion the organic competition in the shape of animal enemies, chiefly ants, is possibly less severe in the Himalayas than it is further south, an assertion founded principally on personal observations in Ceylon, where, notwithstanding the wonderful richness and marvellous luxuriance of the vegetation, butterflies are comparatively very scarce in individuals (with a few exceptions), while ants, which probably constitute their principal enemies in the adolescent state, are, on the other hand, exceedingly abundant there. In this "Isle of Spices," in fact, I found butterflies less plentiful in individuals, and the number of species to be procured in a single day frequently fewer than in many localities in the South of England. That this was not my experience alone, I may recall the fact that the late Sir Greville Smyth, whom I met collecting up at Kandy upon various occasions, remarked to me that, although he had made several visits to Ceylon, he had always found

butterflies scarce. This may be an extreme example, but it is possible to see as many butterflies in the Sikkim Himalayas in the course of twelve hours as in Ceylon during a stay of twelve months, if alone we except those wonderful migratory hosts (usually composed of three or four species only) which periodically make their appearance, and vanish completely out of sight a day or two afterwards. Anyhow, the singular fact remains that butterflies are by far more plentiful in species and conspicuous in individuals, in certain localities in the Himalayas, than is the case in any other portion of the Eastern Hemisphere, inside the Tropics or without, and this applies with equal force to the Papilionidæ. Indeed, the very first butterfly that I espied on the ever-memorable occasion of my premier journey up the "Hills" by the diminutive train of the Darjeeling-Himalayan Railway from Siliguri was a brilliant, bounding, specimen of *Achillides paris*, this pre-eminently characteristic and extremely exquisite group of green-and-blue-spotted, spoon-tailed, Oriental Papilios being represented by no fewer than four superb species in the immediate neighbourhood of Darjeeling (an additional species occurring in the Simla district), where they are popularly known to Indo-European and Eurasian residents by the appropriate cognomen of "Peacocks."

The majority of the tropical Himalayan Papilionidæ, including a couple of gigantic *Ornithopteræ*, are generally of a larger average size than anywhere else; especially is this the case in extreme wet season forms which fly during the maximum phase of the south-west monsoon. Examples of these, I believe, exceed the dimensions of the same species (with one or two exceptions) elsewhere. These splendid insects, therefore, together with several species of immense silk-moths, the latter numbering in their ranks the largest species of Heterocera in the whole world, *Attacus edwardsi*, besides other magnificent species, provide pre-eminently suitable symbolical lepidopterological representatives of the most elevated and stupendous mountain system upon this terrestrial sphere. To the student of zoogeographical and phytogeographical distribution there is no more interesting field for investigation and inquiry than that supplied by the Himalayas, which provide in a small compass a complete compendium of all the zoogeographical and phytogeographical zones situated upon the horizontal isotherms of the earth. This is the case at least with the single exception of the equatorial, characterised by its cocoanut palms, which I have not seen growing further north than in the neighbourhood of the Ganges near Calcutta, where it is crossed by the Tropic of Cancer. All the other climatal belts are represented between thence and the Arctic Regions with characteristic fauna and flora to correspond.

Although, as I have already alluded to the fact, the Sikkim

Himalayas are situated wholly outside the astronomical limits of the Tropics (being between 27° 5′ and 28° 10′ north latitude), by reason of its sheltered position, equable temperature and superabundant precipitation, the tropical zone is powerfully represented in its animal and plant-life, which extends from the malarial Terai Jungle and Sal Forest at the foot of the outer hills at the low altitude of only about 200 ft. above the sea-level to 2500 ft. or thereabouts. To this circumscribed belt the most strictly tropical species of butterflies are chiefly confined. Among the Papilionidæ, which are specially characteristic of this zone, special mention may be made of the following:—*Ornithoptera rhadamanthus*, *Pangerana didoneus*, *Tamera castor*, *Menamopsis slateri*, *M. epycides*, *Isamiopsis teleachus*, *Paranticopsis megarus*, *P. xenocles*, *P. macareus*, *Pazala glycerion*, *Pathysa agetes*, *P. antiphates*, *P. anticrates*, *Zetides eurypylus*, *Z. bathycles*, *Meandrusa evan*. While the following, although they belong more properly to the fauna of the peninsula, may also be enumerated, namely:—*Menelaides aristolochiæ*, *Iliades polymnestor*, *Lærtias polytes*, *Orpheides erichthonius*, *Pathysa nomius*, the second and fifth of which are only occasional stragglers from the plains, and have not been known to perform their metamorphoses within the district under discussion.

Most of the typical forms of arborescent vegetation extend upwards to 5000 ft. or thereabouts, which may be taken to be the upper limits of the subtropical zone, between which and the one below there is apparently not a great deal of difference either in the zoological or the botanical physiognomy, so that the fauna and flora are in reality only an extension of the preceding, the principal difference consisting in the gradual elimination of the strictly tropical element towards the confines of the belt above. The majority of the intertropical species of butterflies ascend to various altitudes within this zone, for the most part, however, performing their transformations probably below 4000 ft., though in the imago state some of them may occasionally be seen considerably higher up the mountain sides, while towards the upper limits an entirely new element commences to come into existence in the shape of temperate modifications of a tropical fauna.

Between 5000 ft. and 7500 ft. or so the warm-temperate zone holds sway with its sombre, dense forests of dark olive-green oaks and chestnuts and thick undergrowth of laurels and ferns. It is here that some of the most interesting Himalayan Papilionidæ have their headquarters, the various species which are endemic or nearly so to this particular climatal belt consisting exclusively of temperate modifications of tropical forms belonging to the Indo-Malayan fauna, corresponding to those occurring in the more elevated districts of Southern China, most of them, indeed, being absolutely identical therewith. The following is a

list of these interesting Himalo-Chinese species :—*Byasa ravana*, *B. plutonius*, *B. alcinous*, *B. latreillii*, *Panosmiopsis janaka*, *Achillides krishna*, *A. arcturus*, *A. polyctor*, *Cadugoides agestor*, *C. govindra*, *Pathysa paphus*, *Dabasa gyas*, *Teniopalpus imperialis*, and *Armandia lidderdalii*.

Some of these also occur at equivalent elevations upon the plateau of the Cossyas in Assam, where in fact the exceedingly magnificent *T. imperialis* seems to have its metropolis, judging from its more frequent occurrence there than in the Himalayas. Darjeeling (where I made my headquarters) at the altitude of 7500 ft. above the level of the sea is situated towards the upper limits of the warm temperate zone, the mean annual temperature being 55° Fahrenheit. Here, as elsewhere on the sub-Himalayas or Outer Hills, particularly those which are in close proximity to the deep hot tropical valleys, such as the Teesta and the Rungeet, several otherwise strictly tropical species occasionally ascend to the highest limits of this zone, a complete list of them, according to my own observations, being as follows : —*Ornithoptera cerberus*, *Pangerana astorion*, *Panosmiopsis rhetenor*, *Achillides paris*, *Sarbaria ganesa*, *Iliades agenor*, *Sainia protenor*, *Charus helenus*, *C. chaon*, *Dalchina sarpedon*, *Zetides agamemnon*. Three others—*Byasa dasarada*, *B. philoxenus*, and *Dalchina cloanthus*—are almost equally characteristic of the tropical and temperate zones, the two former occurring regularly up to 8000 ft., the latter up to 7000 ft., at least in the North-west Himalayas.

On the outer hills, from 7500 ft. up to fully 10,000 ft. above the sea-level, the peculiar Himalo-Chinese element (of which I have given a list), although in decreasing numbers, continues to predominate, that is to the extreme confines of the cold-temperate zone, with its deciduous trees of Central European aspect and appearance, but this is in reality rather owing to a paucity of palæarctic species of Rhopalocera than to a plentifulness of Indo-Chinese forms, and the same phenomenon precisely holds good with respect to nearly all the other groups of insects also. In the "interior" of Sikkim, however—that is, on the southern declivities of the meridional ridge of the great central snow peaks—the preceding condition of things begins to become reversed as low as 8000 ft., where, owing to a much drier atmosphere and a sunnier though colder climate, the temperate fauna and flora commence to predominate at a lower altitude than upon the outer hills, where the precipitation is so excessive, but the only representative of the palæarctic Papilionidæ which exists therein is a local form of the common *Papilio machaon*, which, however, is exceedingly plentiful in certain places. Even here there are several "Papilios" of Indo-tropical character, but they are all very scarce apparently in individuals. On the outer "hills" within the present zone the following may be

enumerated as being indigenous thereto—that is, undergoing their metamorphoses there:—*Byasa latreillii*, *Achillides krishna*, *A. arcturus*, *Teniopalpus imperialis*.

While in the "interior" I have only met with the penultimate species named, with a certainty, though I occasionally saw, but was not able to procure, specimens of a large black species, which I think possibly was the above-mentioned *Byasa latreillii* (better known as *P. minereus*). This happened near the junction of that exceedingly interesting district mentioned by Sir Joseph Hooker in his 'Himalayan Journals,' which constitutes the transitional area between the Indo-Malayan and Palæarctic regions, in which one may almost in the space of a few yards pass at once from a tropical to a temperate fauna and flora.

Between 10,000 ft. and 12,500 ft., which corresponds to the lower alpine zone, the only species which is indigenous therein is *Papilio machaon*,* which is, moreover, confined, as far as my experience is concerned, to the lower portion thereof, although several wanderers from the tropical zones occasionally pay it a visit during warm spells of sunshine at the height of the south-west monsoon, but they must invariably soon perish, like the locusts which sometimes succumb in swarms among the snow. I have thus seen males of *Iliades agenor* as high as 11,000 ft. at Yatung in the Chumbi Valley, in Thibet, which is physically, though not politically, part of the Bhutanese Himalayas. Tropical species of other families occasionally soar even higher still during exceptional spells of warm sunny weather experienced at intervals towards the middle heights, but they none of them perform their metamorphoses at anything like these elevations in the Himalayas, though they look sufficiently out of place in the winged state among the forests of firs and larches which clothe the mountains above 10,000 ft., as in like manner near the sea-level in Norway.

Towards the upper limits of the sub-alpine belt—that is, on approaching the termination of the forests of conifers—no species of Papilionidæ are apparently indigenous,† but on making an exit into the upper alpine or pseudo-arctic zone at 13,000 to 14,000 ft. or thereabouts, and arriving in the belt of bushes, gregarious rhododendrons of various species predominating, several species of *Parnassius* are encountered, which occur from thence right up to the perpetual line of congelation. This latter phenomenon prevails at an average elevation of from 16,000 to 18,000 ft. above the sea-level on the southern declivities of the meridional ridge of the Central Himalayas in Sikkim, though it is as much as from 1000 to 2000 ft. higher on the northern

* This refers to the South-eastern Himalayas only. In the Simla district Dr. G. B. Longstaff has met with *Parnassius hardwickei* as low as 10,000 ft. within the present belt.

† *Ibid.*

or Thibetan side, an anomaly which has been sufficiently explained by Sir J. W. Hooker in his well-known 'Himalayan Journals.'

The snow zone is practically only a continuation of the preceding, characterized botanically by its dwarf alpine herbs, the same as in the polar regions; while among the Parnassinæ, so typical of the lepidopterological fauna of the more elevated mountains of northern Asia and Europe, three species occur in Sikkim—*Parnassius hardwickei*, *jacquemonti*, and *acco*; with three others in the continuation of the chain towards the north-west—*Parnassius charltonius*, *actius*, and *stoliczkanus*. Of these I collected *P. hardwickei* and *P. jacquemonti*, both as high as 18,000 ft. on the southern ascent of the Donkia Pass, in close proximity to the Thibetan frontier.

In drawing up the accompanying list illustrating the vertical distribution of the Himalayan Papilionidæ, I have been guided principally by my own personal experiences in the Sikkim Himalayas, but where such first-hand information was wanting I have supplemented it by making use of the data contained in the 'List of the Butterflies of Sikkim,' by Lionel de Nicéville, already alluded to, as well as the admirable "Catalogue of the Lepidoptera of Sikkim," by Mr. H. J. Elwes, with the assistance of the late Otter Möller, published in the 'Transactions of the Entomological Society of London in 1888.' My principal object in compiling the same is to elicit further information respecting the vertical range of species which are either very rare or unrepresented in that part of the Himalayan chain which I visited, and must be considered as only of a preliminary character. The chief difficulty in the way of tabulating the vertical distribution of the Himalayan Lepidoptera consists in not being able to distinguish between those species which are truly indigenous to the various climatal zones—that is, performing their metamorphoses there, as most of the commoner species occasionally occur in the winged state only for several thousand feet above the altitude at which they underwent their transformations, either through a spirit of adventure, or by being carried up involuntarily, in a measure, by warm ascending currents of air, as I have frequently seen them during exceptional spells of hot weather experienced during the progress of the south-west monsoon. What is absolutely necessary is to ascertain where the different species undergo their adolescent existence, and this was out of the question during a short stay of seven months in the districts under consideration.

In the accompanying table the numbers in the columns correspond to the following climatal zones as defined by that great scientific traveller Baron Humboldt:—

(1. Equatorial Zone ... ... Unrepresented.)
2. Tropical Zone ... . 200–2500 ft.
3. Sub-Tropical Zone ... ... 2500–5000 ft.
4. Warm Temperate Zone ... 5000–7500 ft.

5. Cold Temperate Zone ... ... 7500–10,000 ft.
6. Sub-Alpine or Sub-Arctic Zone 10,000–12,500 ft.
7. Alpine or Arctic Zone ... ... 12,500–15,000 ft.
8. Snow or Polar Zone ... ... 15,000–17,500 ft.

These figures must only be considered as approximately correct, as they vary greatly in different parts of the chain. In the interior of Sikkim, as well as in the North-west Himalayas, zones 2 to 6 are generally from 1000 to 3000 ft. lower, while in the latter part of the chain the alpine and snow zones rise considerably higher.

The following abbreviations have been employed:—

E. Signifies that the species is only found, so far as is known, to the eastward of Nepaul: 33 species.

W. That the species is confined to the west thereof: 5 species.

The number of species which range throughout the entire chain consisting of 19 species.

While the total number recorded from the whole of the Himalayas is 57 species.

* Denotes that the species is probably only an immigrant in the particular zone indicated, and does not perform its metamorphoses there. Including these occasional visitors, the number of species occurring in each climatal zone may be given approximately as under:—

2. Tropical Zone ... ... 36 species.
3. Sub-Tropical Zone ... ... 31 ,,
4. Warm Temperate Zone ... 28 ,,
5. Cold Temperate Zone ... ... 11 ,,
6. Sub-Alpine or Sub-Arctic Zone 3 ,,
7. Alpine or Arctic Zone ... ... 6 ,,
8. Snow or Polar Zone ... ... 6 ,,

In the South-eastern Himalayas, on the outer hills, zones Nos. 2, 3, 4, and 5 belong in preponderating degree to the Indo-Chinese province of the Indo-Malayan Region of zoogeographers, while in the interior thereof, zones Nos. 5 and 6 belong, in like measure, to the Manchurian province of the extensive Palæarctic Region; the latter, however, being considered, in the North-west Himalayas, as approximating more closely to the Mediterranean province of the same. Throughout the entire chain, zones Nos. 7 and 8 belong exclusively to the Siberian province of the Palæarctic Region of Messrs. P. H. Sclater and A. R. Wallace.

An analysis of the Himalayan Papilionidæ according to their zoogeographical affinities furnishes the following interesting results:—

Belonging to the Indo-Chinese province of the Indo-Malayan Region: 38 species (of which 9 also occur in the Indo-Malayan province).

Belonging to the Hindustani province of the Indo-Malayan Region: 2 species (of which 1 also occurs in the Cingalese province).

Belonging in equal degree to the Hindustani and Indo-Chinese provinces : 10 species.

Total for Indo-Malayan Region : 50 species.

Belonging to the Manchurian and Mediterranean provinces of the Palæarctic Region : 1 species.

Belonging to the Siberian province of the Palæarctic Region : 6 species.

Total for Palæarctic Region : 7 species.

But these statistics exclude the species of Indo-Malayan origin which also occur in the Palæarctic Region in the Himalayas, which, including immigrants, amounts to about ten, increasing the total of the family occurring in the Palæarctic portion of the chain to seventeen. While, if we include all those species which frequent the two temperate zones on the outer hills, which belong climatically, although not zoologically, to the Palæarctic Region, the number of tropical and temperate modifications of tropical forms belonging to the Indo-Malayan Region would be represented by the substantial total of twenty-eight, some eighteen being indigenous thereto, the remaining ten being only casual visitors. This affords an interesting comparison to that which is the case in the preponderatingly Palæarctic province of Northern China and Japan, where in corresponding climatal zones, though considerably further north, a somewhat similar intermingling of tropical and temperate forms takes place. Here, however, though the Indo-tropical element in the Rhopalocera fauna is probably equally in evidence as regards the number of individuals is concerned, the number of temperate Palæarctic species is considerably in excess. This, however, does not apply to the Papilionidæ, in which family, strange to say, the tropical element is most numerous in species, consisting, in fact, of seventeen to only five of a Palæarctic temperate character, according to Mr. H. J. Elwes in his interesting paper "On the Butterflies of Amurland, North China, and Japan," published in the 'Proceedings of the Zoological Society of London for 1881,' in which are given the names of as many as ten Himalayan species (including *Papilio machaon*), which are also found there.

It was no doubt the fact of the Indo-tropical facies being so pronounced that induced the late Dr. Staudinger to regard North China and Japan as an integral part of the Indo-Malay Region, although I personally fully concur with my venerable friend Dr. Alfred Russel Wallace in considering that they should be retained in the Palæarctic Region, to the Manchurian province of which they properly belong.

I will conclude by stating that the number of Himalayan Papilionidæ which range southwards to the equatorial districts of the Malay Peninsula, the Malay Archipelago, the Deccan, and Ceylon (including representative forms and geographical varieties) consists of at least twenty species.

List of the Papilionidæ of the Himalayas showing their Vertical Distribution.

Census of Species.	Climatal Zones.							Approximate Range of Altitude in Feet.
	2	3	4	5	6	7	8	
Papilionidæ.								
1. *Ornithoptera rhadamanthus.* E.	2	3						200–3000
2. *O. cerberus.* E.	2	3	4*					200–7500
3. *Pangerana astorion.* E.	2	3	4*					200–7000
4. *P. didoneus. E.*	2	3						1000–3000
5. *Byasa ravana*			4?					
6. *B. plutonius.* E.			4?					
7. *B. alcinous.* E.			4?					
8. *B. latreillii.* E.			4	5				7000–9000
9. *B. dasarada.* E.	2	3	4	5*				1000–8000
10. *B. philoxenus*	2	3	4	5*				1000–8000
11. *Panosmiopsis rhetenor.* E.	2	3	4*					200–6000
12. *P. janaka.* E.		3	4					3000–7500
13. *Menelaides aristolochiæ*	2	3						200–3000
14. *Achillides paris*	2	3	4*					200–7500
15. *A. krishna.* E.		3	4	5				3000–9000
16. *A. arcturus*		3	4	5				3000–9000
17. *A. polyctor.* W.		3?	4?					
18. *Sarbaria ganesa.* E.	2	3	4*					200–6000
19. *Iliades agenor.* E.	2	3	4*	5*	6*			200–11,000
20. *I. polymnestor.* E.	2							200–500
21. *Sainia protenor*	2	3	4*					2000–6000
22. *Charus helenus*	2	3	4*					200–7500
23. *C. chaon.* E.	2	3	4*					200–7500
24. *Tamera castor.* E.	2	3						1000–3000
25. *Lærtias polytes*	2	3						200–3000
26. *Orpheides erichthonius*	2							200–1500
27. *Menamopsis slateri.* E.	2							200–500
28. *M. epycides.* E.	2	3						200–3000
29. *Isamiopsis teleachus.* E.	2?							
30. *Chilasa clytia* (=*panope*)	2	3						200–3000
31. *Paranticopsis megarus.* E.	2?							
32. *P. xenocles.* E.	2	3						200–3000
33. *P. macareus.* E.	2							200–1000
34. *Cadugoides agestor*			4	5				5000–8000
35. *C. govindra.* W.			4	5				
36. *Pazala glycerion.* E.	2	3						2000–4000
37. *Pathysa paphus.* E.		3	4					3000–7500
38. *P. agetes.* E.	2							200–500
39. *P. antiphates.* E.	2	3						200–3000
40. *P. anticrates.* E.	2							200–1000
41. *P. nomius.* E.	2							200–500
42. *Dalchina cloanthus*	2	3	4	5				2000–7000

Census of Species.	Climatal Zones.							Approximate Range of Altitude in Feet.
	2	3	4	5	6	7	8	
43. *Dalchina sarpedon*	2	3	4					200–7500
44. *Zetides eurypylus*	2	3						200–3000
45. *Z. bathycles.* E.	2	3						200–3000
46. *Z. agamemnon*	2	3	4*					200–7500
47. *Dabasa gyas.* E.			4					6000–7000
48. *Meandrusa evan.* E.	2							
49. *Papilio machaon*				5	6			8000–12,000
Teinopalpinæ.								
50. *Teniopalpus imperialis.* E.			4	5				6000–10,000
Thaidinæ.								
51. *Armandia lidderdalii.* E.			4					5000–5500
Parnassinæ.								
52. *Parnassius hardwickei*					6	7	8	10,000–18,000
53. *P. jacquemonti*						7	8	15,000–18,000
54. *P. acco*						7	8	
55. *P. charltonius.* W.						7	8	
56. *P. actius.* W.						7	8	
57. *P. stoliczkanus.* W.						7	8	

ON A NEW SPECIES OF *ZEUTHUS* (EUMENIDÆ) FROM BORNEO.

By P. Cameron.

Zeuthus etchellsii, sp. nov.

Black; the clypeus except round the top and sides, the mandibles except the teeth, a small spot over the antennæ on the inner side and a line on the under side of the antennal scape, yellowish-white; wings fuscous-violaceous, the nervures black; the second abscissa of the cubitus bends downwards at the base and receives the second recurrent nervure at the apex of the bent-down part; the second transverse cubital nervure is broadly, roundly curved, the third cubital cellule is wider in front than behind. Clypeus almost as wide as long, rounded above, the apex broadly, but not deeply curved inwardly. The base of the first and of the second abdominal segment more shortly, distinctly narrowed; the petiole is almost as long as the following segments united; it is flat above, closely, but not very strongly punctured; the base is more or less finely, closely longitudinally striated; the base of the thorax is broadly rounded, laterally, the

centre transverse, keeled, the sides of the metathorax rounded at the apex. The third joint of the antennæ is as long as the scape, and fully one-quarter longer than the fourth. Metanotum short, sharply oblique, its centre without a distinct furrow. Head closely, the thorax more strongly, but not so closely punctured; the pubescence dense, longer on the head than on the thorax. There is a small tooth on either side of the apex of the first abdominal segment on the ventral side; the apex above is transverse and is not narrowed. ♂. Total length 21 mm.

Kuching, Borneo, July (John Hewitt).

There are no distinct grooves on the mesonotum nor on the scutellum; down the middle of the latter is a fine keel. The base of the metapleuræ is smooth, the base and apex of this part with a crenulated border. Palpi pale testaceous. There is a smooth, shining, triangular space on the sides of the metanotum at the base. The front is raised and transverse above the antennæ. The furrow separating the scutellums is narrow and moderately deep.

Allied to *Z. hero*, de Haan, and *Z. dolosus*, Bing.

This fine species is dedicated to my late housekeeper, Mary Etchells, in grateful remembrance of many years' faithful service.

DESCRIPTIONS OF THREE NEW SPECIES OF *CICADIDÆ*.

By W. L. Distant. 1909d

Rihana atra, sp. n.

♂. Body and legs black; eyes, coxal spots, basal joint of rostrum, and extreme apices of femora and bases of tibiæ ochraceous; ocelli and a central spot to clypeus (sometimes absent) sanguineous; tegmina hyaline, costal membrane black, venation piceous, basal cell hyaline with its upper half piceous, a basal claval streak pale emerald-green; wings hyaline, extreme base black and spotted with emerald-green, a streak of the same colour occupying the greater part of the inner or anal cell; head longer than half the breadth between eyes, including eyes broader than base of mesonotum; face moderately prominent, the transverse striations robust, centrally longitudinally finely sulcate; opercula not quite reaching basal joint of abdomen, moderately convex, their outer magins reflexed, their inner margins contiguous for about one-third from base and then obliquely directed to apices which are rounded, their surface coarsely wrinkled; posterior lateral margin of the metasternum brownish-ochraceous or piceous brown; posterior tibiæ with two slender spines beyond middle.

♀. Body beneath and legs paler, more or less brownish-ochraceous or piceous-brown; basal segment of abdomen above distinctly

posteriorly margined with brownish-ochraceous. Long. excl. tegm. ♂. 29 to 30, ♀. 26 millm. Exp. tegm. ♂. 91 to 94, ♀. 89 millm.

Hab. Philippine Islands; Manilla (C. S. Banks).

Allied to *R. bimaculata*, Oliv.

Rihana seminiger, sp. n.

♂. Body above black; eyes, posterior margin of pronotum, the narrow margins to two central obconical spots to mesonotum, the base of the cruciform elevation and the lateral margins of the metanotum, dull, obscure olivaceous; a large transverse lateral spot on each side of the second abdominal segment and a round spot on each side of base of anal segment cretaceous-white; head beneath, sternum and opercula thickly greyishly pilose; face with the transverse ridges black and with a central longitudinal ochraceous fascia which is centrally attenuated and also longitudinally continued on clypeus; opercula with their inner margins (broadly) and their outer and posterior margins (narrowly) black; abdomen beneath black, the abdominal segmental margins obscure olivaceous, a spot on each side of the second abdominal segment and one on each side of the sixth segment cretaceous-white; legs black, apices of femora and bases of tibiæ more or less ochraceous; tegmina and wings hyaline, in some lights with a pale bluish reflection, the venation either piceous or brownish-olivaceous; tegmina with the costal membrane and basal cell brownish-olivaceous, the extreme base virescent; length of head more than half the breadth of space between eyes; face broadly, moderately prominent; opercula broad, not extending beyond base of abdomen, their posterior margins broadly rounded, their inner margins a little overlapping, their lateral margins nearly straight; rostrum slightly passing the intermediate coxæ, ochraceous, centrally, longitudinally and apically black. Long. excl. tegm. ♂. 30 millm. Exp. tegm. 97 millm.

Hab. India; Nilgiri Hills (H. L. Andrewes, Brit. Mus.).

Allied to *R. atra*, Dist., from the Philippines.

Terpnosia mawi, sp. n.

Head, pronotum and mesonotum virescent; head with broad anterior lateral margins to vertex, two large transverse anterior spots to front, area of the ocelli, and two small spots on each side between the ocelli and eyes, black; eyes brownish-ochraceous or piceous-brown; pronotum with two central longitudinal fasciæ, widened anteriorly and posteriorly and more divergent in front than behind, on each side of these a curved discal spot, and the furrows black; mesonotum with two short anterior obconical ochraceous spots the margins of which are black, a broad curved sublateral fascia on each side and an irregular cruciform spot in front of the basal cruciform elevation black, anterior angles of the cruciform elevation also black; abdomen above virescent or greenish-ochraceous, with a double discal segmental series of large spots, a lateral series of smaller spots and the apical area black; head beneath, sternum, legs and opercula virescent; base and two central longitudinal fasciæ (united posteriorly) to face, central fascia to clypeus, apex of rostrum, spines to anterior

femora, apices of tibiæ, and the tarsi black; abdomen beneath pale ochraceous, base (narrowly) and apex (broadly) black; tegmina and wings hyaline, the venation piceous; tegmina with the apical veins to the second and third ulnar areas infuscated, a small black and ochraceous spot at apex of radial area; face elongate, prominently transversely ridged on each side; rostrum reaching the posterior coxæ; length of head about equal to breadth between eyes; tympanal coverings narrower and shorter than tympanal cavities; opercula in male short, oblique, not quite reaching base of abdomen, the lateral margins moderately sinuate; anterior femora with three strong spines beneath. Long. excl. tegm. ♂. 26 millm. Exp. tegm. 68 to 70 millm.

Hab. China; Prov. Shen-se, Sin-ling (Wilfred A. Maw, Brit. Mus.).

Allied to *T. stipata*, Walk., from Ceylon.

ON TWO NEW GENERA (ONE REPRESENTING A NEW TRIBE) FROM BORNEO.

By P. Cameron.

Eutanycormus, gen. nov.

♂. Antennæ probably thirteen-jointed, the last (probably two closely amalgamated) thicker than the others, closely shortly pilose, the other joints of the flagellum fringed with longish stiff hair; they are placed shortly above the middle of the face. Eyes oval, malar space almost two-thirds of their length. Clypeus small, separated from the face by a wide semicircular depression. Pronotum twice the length of the mesonotum, not quite twice longer than wide, roundly narrowed in front. Mesonotum wider than long; parapsidal furrows distinct, running from the outer basal edge obliquely to the scutellum, from the base of which deep curved furrows run to the tegulæ; it is large, flat. Metanotum flat to the apex, which has a short steep slope; the lower part of the metapleuræ with an oblique furrow, which becomes gradually widened towards the apex. Abdomen flat, shorter than the thorax, the first segment almost sessile, as long as the following two united. Legs moderately stout, the hind femora normal, not much longer than the hind coxæ. Stigmal branch large, thickened, longish ovoid; there is no post-marginal vein; the margin nervure short compared with the submarginal, it being about one-third of its length; from near the base of the apical third of the submarginal a stout nervure runs obliquely to the posterior part of the wing. The hind wings have nervures as in the anterior, except that there is no stigmal branch. The head and thorax are more or less striated; the mandibles apparently edentate, the apex broad, oblique. Ocelli in a curve. Head seen from the front longer than wide. The abdominal sutures are transverse.

The female has the antennæ short, stout, the third joint distinctly longer than the fourth, the flagellum densely pilose; its apex does not reach to the tegulæ when turned back. There is a long, thin

ovipositor, longer than the body. There is a transverse furrow at the base of the scutellum, from either side of which a shorter oblique one runs along the sides. As in the male, I can detect no proper teeth on the mandibles; the apex of the latter has a furrow in the middle.

Belongs to the Toryminæ, in which it will form a new tribe sufficiently characterized by the densely pilose antennæ, and, more particularly, by the presence of the oblique nervure issuing from the submarginal. The latter is a feature which I cannot find in any Chalcid in my collection, nor can I find any genus described with such an additional nervure.

Eutanycormus pilicornis, sp. n.

Black, smooth, and shining, sparsely covered with longish black hair; the antennal scape and legs rufo-testaceous, the mandibles and oral region of a slightly darker rufo-testaceous colour; wings hyaline, the nervures blackish, the stigmal spot longish oval. ♀. Length, 5 mm.; ovipositor, 8 mm.

Kuching, Borneo (John Hewitt, B.A.).

Metanotum, except the outer edges, transversely rugose; a curved crenulated furrow in the centre of the smooth outer part. Metapleuræ smooth above, the lower part striated at the base, the rest coarsely aciculated, the middle broadly depressed. There is a wide depression on the apex of the mesopleuræ, formed by the apex of the latter being depressed, and by the base of the metapleuræ being raised; the depression does not reach to the top of the pleuræ, and is narrowed above; it is finely, closely, longitudinally striated; the part above it is less closely striated. The collar is about one-half longer than wide, and is roundly narrowed at the base.

CLEONYMINÆ.

Taoga, gen. nov.

Antennæ thirteen-jointed, the scape not reaching to the ocelli. Eyes hairy, large, oval, the malar space as long as them. Parapsidal furrows narrow but distinct. Scutellum large, its apex broadly rounded. Metanotum short, its apex transverse above; it has a steep vertical slope. Abdomen sessile, its base transverse, fitting close to the metanotum; the second segment fully one-half the length of the first, the third as long as them both united; its apical half has a central keel, which is prolonged along the back of the basal segment of the ovipositor; the latter is keeled along the sides; it is as long as the basal part of the abdomen; the following segment is half its length; both are densely pilose. The apical segments are apparently absent. Marginal branch half the length of the submarginal; the stigmal short, thick, dilated at the apex; the post-marginal branch short. Legs normal; the tarsi five-jointed, the spurs short; there are two on middle tibiæ; the claws short and slender. The antennæ issue from near the base of the clypeus, below the eyes; frontal depression wider below than the eye orbits; in the centre of the lower half is a wide keel, narrowed towards the top, where it is raised.

Ocelli in a triangle. The abdominal segments are transverse. There is only one spur on the middle tibiæ; it is small. Pronotum short. Labrum visible at the excised apex of clypeus.

Is nearest to *Elemba*, Cam., which may easily enough be separated from it by the eyes not being hairy, by the absence of parapsidal furrows, by the longer and thinner abdomen, of which the second segment is not as long as the first, and by the longer and thinner, more curved stigmal branch.

Taoga rufipes, sp. n.

Antennæ black, the basal half of the scape dark red, the legs red, the coxæ dark blue. Vertex black, tinged with blue, the occiput dark green, darker in the middle; the sides of front blue to near the bottom of the eyes; the lower part, face, and malar space emerald-green, as are also the outer orbits. The head is closely somewhat strongly reticulated, punctured, the vertex more finely than the rest. On the lower half of the antennal depression is a longish wedge-shaped keel, which becomes gradually narrowed from the bottom upwards. Basal joints of palpi dark red; the palpi densely covered with white pubescence. The sides of the head, pleuræ, and base of legs densely covered with longish white pubescence. Basal slope of pronotum emerald-green, bluer at the apex; there is a narrow smooth line down the centre. Mesonotum, scutellum, and apical slope of metanotum purplish black; a bluish purple mark on either side of the apex of middle lobe of mesonotum, the parts round the scutellum, the apex of scutellum, base of metanotum, apex of propleuræ, base and apex of mesopleuræ, and the metapleuræ bluish purple, the rest of the pleuræ blackish purple. Abdomen purple; the terebra black, the apices of the segments blue, smooth, and shining. Wings hyaline, iridescent, the stigma and nervures black; a narrow streak along the costa. ♀. Length, 14 mm.

Kuching, Borneo (John Hewitt, B.A.).

Closely punctured, the thorax slightly more coarsely than the head, the abdomen more finely than either; the punctures on the pleuræ running into reticulations. Pleural tubercles large, smooth, and shining. Middle lobe of mesonotum clearly separated, the furrows distinct. Malar space as long as the eyes, the middle furrowed.

NOTES AND OBSERVATIONS.

Lycæna corydon in Devonshire.—Neither in the recent book, 'The Butterflies of the British Isles,' nor in the late C. G. Barrett's list in the 'Victoria History of Devon,' do I see any mention of the occurrence of *Lycæna corydon* in Devonshire. It may therefore interest you to know that I caught a male specimen of this species on the Devon coast, about two miles west of Beer Head, on August 6th, 1908. I gave the specimen at the time to a friend who was with me, and he subsequently wrote to me that he took another example of *L. corydon* at the same spot, on August 17th, 1908. The particular sea-bank

is much favoured by butterflies, and *Leucophasia sinapis*, *Adopæa actæon*, and *Lycæna adonis*, together with other local species, can be taken in plenty at the proper seasons. I have also seen *Zephyrus betulæ* there.—(Rev.) F. L. Blathwayt; 1, Stonefield Avenue, Lincoln, July 12th, 1909.

Extended Pupal Periods in the Genus Eupithecia.—Prof. Meldola's experience with *Eupithecia togata*, recorded in the current 'Entomologist,' p. 182, is by no means unusual for that species and several others of the genus. The following occur to me as prone to go over two winters in pupa: *E. venosata* and *pulchellata* (particularly Scottish), *E. haworthiata* (*isogrammaria*), *fenestrata*, *expallidata*, and, I think, *plumbeolata*. I have just had an interesting experience with *E. cretaceata*, the American variety or representative of *fenestrata*. From a number of larvæ collected in Vancouver Island in August, 1907, I bred fifteen moths between June 6th and July 8th, 1908; then no more emerged until yesterday (July 4th, 1909), when five appeared with a rush, within three or four hours of one another. No doubt the cold weather of June is largely responsible, but the effect is rather curious. There are few, if any, still left to emerge. I ought to add that several other species which I have bred largely have invariably, in my experience, emerged after a single hibernation, e.g., *E. castigata*, *absinthiata*, *denotata* (*campanulata*), *jasioneata*, &c.—Louis B. Prout; 246, Richmond Road, N.E., July 5th, 1909.

Gynandrous Saturnia pavonia (carpini). — From a hundred healthy Denbighshire cocoons of this species—only fifteen per cent. of which yielded imagos, the rest are lying over—I got a fine female, in May, ornamented with male antennæ. In all other characters the appearance of the moth is feminine.—J. Arkle; Chester.

Enicmus minutus, Linn., attacking Cryptococcus fagi, Bär.—During June, 1908, I noticed this beetle repeatedly among a strong colony of the Coccid upon the bark of a large beech-tree in my garden here. Upon one or two occasions, by the aid of a lens, I actually witnessed *E. minutus* masticating Coccids. This was called to my mind by to-day again noticing several individuals in the same position, but now both insects are much scarcer than at the corresponding period last year: I could discover but half a dozen beetles where there then were as many hundreds. The Coccid, too, is much sparser, which circumstance is doubtless due to the ravages wrought among it by the clavicorn in 1908. Among the *Enicmus* and *Cryptococcus* to-day I saw a couple of specimens of the rare Hemipteron, *Microphysa pselaphiformis*, Curt., which is suggestively stated to occur "on lichen-covered trees"; it was some time before I could satisfy myself that the bark was whitened by a Coccid and not lichen.—Claude Morley; Monk Soham House, Suffolk, July 4th, 1909.

Curious Sexual Conduct of Weevils. — On Saturday last (June 19th) I was surprised to find on a low bush two green weevils (presumably of the *Polydrosus* family, but the precise species I know not) apparently *in cop.* with two females of a much larger species,

which I identify as *Polydrosus micans*. My first impression of a startling difference between the male and female of *micans* was momentary only, but the possibility of a hybrid between two such dissimilar species appeared to warrant further investigation, and the two pairs were accordingly placed in separate glass-tubes and taken home. On my arrival home I found that one pair had separated, and the male had apparently lost all interest in his companion; but in the other tube attempts at copulation continued from 7.30 to 11.30 p.m. uninterruptedly, but at the end of that time I shook the tube up, which separated the insects, and no further attempts were apparently made. In the morning the two were at different ends of the tube, each apparently ignoring the presence of the other. I am satisfied from a careful examination through a strong lens whilst the attempts were being made that copulation did not actually occur. The male organ was for the greater part of its length too inflexible to allow of the penetration of the female organ of the different species, the angle was not right. Save for this, the violent and repeated efforts of the male could only have ended one way. If two insects sexually ripe but of different species are isolated together, the abnormal may occur, but it did strike me as very strange that attempts of this sort should be made right out in the open, where one would have thought the females of the green *Polydrosus* would have far out-numbered the females of *micans*.—C. G. Doughty; 27, South Molton Street, W., and Eghams Farm, Beaconsfield, June 22nd, 1909.

[It is frequently noticed that Coleoptera of two distinct species are in the position of copula without copulation subsequently occurring.—D. S.]

CAPTURES AND FIELD REPORTS.

Abundance of Pieris brassicæ.—During the last three weeks of May *Pieris brassicæ* daily increased in numbers until the end of the month, when in this part of south-east Essex a perfect swarm occurred, but nearly all that I observed were males, it was only during the last few days of May that the females appeared in any number; until then I had not seen half a dozen, while the males were flying in hundreds. *Pieris rapæ* was equally prolific, but the sexes of more equal proportion.—F. W. Frohawk; July, 1909.

Proportionate Number of Sexes of Thanaos tages.—Although the males of most or all species of butterflies appear on the wing some days before the females, I think the following note is worthy of record, considering the date of observation and the fact that I noticed the species flying over the same spot six days previously. On May 21st last I captured forty-five *T. tages* over a small patch of rough ground about fifty yards long by ten yards wide; out of this comparatively large number only one was a female, which deposited a quantity of eggs. Last year, on the evening of June 10th, in the corner of an adjoining field, I found this butterfly in such abundance at rest on the heads of grasses that in some instances there were as

many as five resting together on the same grass-head; on this occasion both sexes were about equal in number.—F. W. Frohawk; July, 1909.

Acronycta aceris Larvæ feeding on Plum.—In August last year I found four small larvæ of *A. aceris* feeding on the foliage of a plum-tree in the garden here. They were transferred to a breeding-cage and supplied with twigs from the plum. Pupation occurred in due course, and two male specimens emerged in late June of the present year. These are perhaps rather small, but they are certainly not less in size than some examples I have reared in former years from larvæ that had fed on sycamore.—Richard South; 96, Drakefield Road, Upper Tooting, S.W.

Cidaria miata emerging in July.—A small batch of the ova of this species were received from Burniston, Yorkshire, on April 25th last. Larvæ from these hatched out April 29th, fed well on sallow, and by June 26th all had pupated. A male specimen emerged on July 5th, followed by another the next day, and two examples of the same sex on the 8th of the month. Between July 11th and 20th two other males and seven females appeared.—Richard South.

Insects in Sicily.—With the Editor's permission I should like to thank my numerous entomological friends for their sympathy with me in the sorrowful time of the earthquake at Messina, which terrible event put a stop for some months to pleasant entomological excursions in the country. The first months of the year proved exceptionally wet, and as I had lost all my entomological apparatus, it was Easter (April) before I could resume collecting. I was then domiciled at Catania, and my first excursion was to the back of Mount Etna, stopping at several towns on the return journey from the mediæval town of Randazzo. A most interesting place for lovers of the antique—not to say ignorant and backward. Situated 3000 or 4000 ft. above the sea-level, the climate somewhat resembles that of England, and warm clothing was a necessity. Mount Etna rises over 10,000 ft., with snow on the upper half, while the nearest mountain to the west is less than 5000 ft., and is sown with corn to the summit. Amongst the boulders separating the cornfields we found a "tiger" caterpillar crawling about on the short grass, &c., very much resembling that of *A. fuliginosa*, but with black bands. I collected a dozen out of hundreds, and to my surprise I bred what I call the "black burnet" moth—*Syntomis phegea*. This insect seems generally distributed in Sicily; the first specimens I came across were in the plain of Catania, in May, almost on the sea level, and subsequently I found it plentifully at Taormina and also at Messina, where it can be picked off the flowers readily by its antennæ, being one of the most obtrusive of the Lepidoptera. The female readily deposits its eggs loosely in a pill-box, and when I reached England on the 16th of June I found that a batch of eggs laid the week before had just hatched. The young caterpillars resemble those of *Arctia villica* (the cream-spot tiger moth), and (imitation being the sincerest form of flattery) I have, in my small way, imitated the entomologists who are trying to re-introduce *Chrysophanus dispar*, whom I wish success,

so yesterday I chose what I considered a good locality near London, and sowed the youthful *phegea* larvæ amongst scattered plants of dandelion, a food they apparently approved of in confinement. Should any collector meet with the species in 1910, please communicate with me, and do not exterminate it.

Crossing the lava beds on Mount Etna between Bronté and Aderno, the "orange-tip" was flying amongst the spurge, almost the only plant which grows there, but which flowers almost as brightly as broom, quite different to our English spurge. The orange-tips seemed also to be far brighter than our English species, but my net was packed away, and I postponed capturing the specimens until a future early visit which never took place. At Aderno I had my net and captured my first *Papilio podalirius*, the loveliest flier amongst butterflies that I have come across. It does not fly, it simply "soars" in the air. This may be an Irish bull, but it is true. Close to Catania a "procession" caterpillar on the pine-trees was very common whenever the pine-trees occurred. Occasionally some caterpillars would be blown down from the large nests on the tops of the trees, and instinctively they formed a line, head to tail, and marched off to regain their food-plant. It was curious to watch a line, over a yard long, crossing the dusty roadway in perfect order. I kept some larvæ, which spun up, but have not yet produced moths, so I am not sure of the species.

Towards the end of May I returned to Messina and resumed my walks up the adjoining mountains. Each day I was able to get three or four fresh species of butterflies, mainly those we get in England, or reputed British species. I found it difficult to get an entire novelty. I own up that I was quite overwhelmed with delight when I got my first and only *Argynnis pandora*; the lovely under side is indescribable. *Charaxes jasius* (one only) does not soar like *P. podalirius*, but flies hurriedly. *M. didyma* makes a brilliant show when in numbers. Our own *P. machaon* frequents the hills, and has a curious habit of settling on a culm of long grass, and floating with open wings from side to side like an inverted pendulum.

As I had no means of setting my specimens, I put them in papers, with data. Later on I hope to set them, and shall then be able to make a complete list of my captures. Speaking generally regarding the butterflies of Sicily, it seems to me that Sicily would make a good appanage to Great Britain, and I am surprised to find that twenty degrees of latitude make so little difference—J. Platt Barrett; 30, Endwell Road, Brockley, S.E., July 10th, 1909.

SOCIETIES.

The South London Entomological and Natural History Society.—*July 8th*, 1909.—Mr. Alfred Sich, F.E.S., President, in the chair.—It was announced that the collections of British and European butterflies made by the late Mr. F. Freeman, F.E.S., of Tavistock, Devon, had been generously presented to the Society by Mrs. Freeman, through Mr. Rowland-Brown. It is contained in two handsome cabinets. The

collection comprises series of almost every European species, as well as of many local and rare forms, including much of the material collected by the late Mr. F. Lemann, F.E.S. This is the only modern collection of European butterflies in London available for reference, and should be of great value to the rapidly increasing number of students of Palæarctic butterflies.—Mr. Sperring exhibited a specimen of *Pararge megæra* from Somerset, in which the usually fulvous markings were of a pale straw-colour; together with five examples of *Cœnonympha pamphilus*, showing five distinct shades of colour, from Porchester, all taken at one time.—Mr. Edwards, a specimen of the rare *Opsiphanes cyme*, from Brazil.—Mr. R. Adkin, a bred series of *Odontopera bidentata*, of Yorkshire origin, and contributed notes on the results of the breeding, particularly with regard to the production of black forms.—Mr. B. Adkin, a short series of very curious small specimens of *Cidaria suffumata* from North Devon, showing very close superficial resemblance to *C. silaceata*.

June 10*th*.—Mr. W. J. Kaye, F.E.S., Vice-President, in the chair. —Mr. Stanley Edwards exhibited specimens of the centipede *Scolopendra morsitans*, from Jamaica.—Mr. Newman, imagines of *Dicranura bicuspis* from Tilgate Forest, *Dianthœcia conspersa* and *D. carpophaga*, and larvæ of *Gastropacha quercifolia*.—Mr. Main, two larvæ of *Limenitis populi* from Saxony, and the egg, cocoon, and young larvæ of *Hydrophilus piceus*, the large water-beetle.—Mr. Rayward, living larvæ of *Polygonia c-album* from the ova previously shown.—Mr. Tonge, on behalf of Mr. Grosvenor, ova of *Cyclopides palæmon* (*paniscus*).—Mr. F. Noad Clark, a dipteron bred from a larva voided by a sheep in its excrement.

June 24*th*.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Newman, a very curiously mixed gynandromorphous specimen of *Saturnia carpini*, mainly male but with female characters scattered about the wings and body. He also showed some almost black *Dianthœcia conspersa* from Shetland, living larvæ of *Nyssia lapponaria* from Glasgow, a very heavily dark-speckled form, and beautifully banded forms of *Angerona prunaria*, a living example of *Sesia andreniformis*, &c.—Mr. Green, a short series of *Leucania vitellina*, taken at sugar in East Kent in October, 1907 and 1908.—Dr. Chapman, specimens of the recently much discussed *Pieris manni*, taken by him in the Eastern Pyrenees during the present spring.—Mr. Turner, a number of figures of varieties of *Arctia caja*, and also the photograph group of the delegates and members of the Congress of the South-eastern Union of Scientific Societies, held at Winchester, which Messrs. Adkin, Sich, Step, Tutt and he attended.—Mr. Adkin, a specimen of *Nonagria* from Sussex that had been named *edelstoni*, and examples of the species commonly known as *neurica* (*arundineta*) and made remarks on the specific distinction of the two species.—Mr. Step, as delegate, read a report of the recent Congress at Winchester, giving a detailed account of the proceedings day by day. —Mr. Tutt read a paper entitled "The Darwin Commemoration—Thoughts—Species"—being reminiscences and reveries induced by the re-perusal of some of the volumes of the 'Entomologists' Weekly Intelligencer' of half a century ago.—Hy. J. Turner, *Hon. Rep. Sec.*

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CLINODIPLOSIS EQUESTRIS (WAGNER); AN INSECT NEW TO GREAT BRITAIN.

BY FRED ENOCK, F.L.S.

IT is with feelings of anything but pleasure that I record the appearance of this wheat "pest" in Great Britain. On August 18th, 1908, Mr. George E. Mainland, F.R.M.S., of Tenby, sent

Wheat-stalk, showing larvæ *in situ*, and damage between each joint and to the ear.

to me a box of wheat-stalks taken from a field in that neighbourhood. Between each joint, underneath the leaf-sheath, were from six to nine apodous larvæ of a bright red colour, resting in a curled position, each in a cavity in the stalk three-sixteenths

of an inch long, with a growth at the head and bottom, much resembling (in miniature) a niche in the wall of a cathedral. The larvæ were actively twisting about, evidently full-grown, for in a few days they left the stalks and buried themselves in the light soil from the field.

Specimens were sent (by the owner of the field) to the Board of Agriculture and Fisheries for name and information how to treat the pest which had attacked the wheat and barley. The advisers of the Board informed the owner that "the wheat was suffering from an attack of the Hessian Fly!"

As I had worked out the life-history of this destructive insect, I felt fully justified in flatly contradicting this statement, and some months after, when all the larvæ had buried themselves and so got beyond control, the advisers then informed the owner that the larvæ were those of *Diplosis aurantiaca*, "a dangerous wheat pest"; but, so far as I can ascertain, this was about all that was done by the Board of Agriculture.

I sent a photograph of the injured stalks to Dr. L. Howard, the United States Entomologist and Head of the Bureau of Entomology, Board of Agriculture; but he was glad to say that nothing of the kind had been seen in America, and that it was quite new to him.

I kept my larvæ in the soil until June of this year, when I found several in very much the same condition as when I last saw them. I asked Mr. Mainland to send me a good supply, which he did on June 12th. Some of these I observed change to pupæ, which very much resembled the larvæ in colour. Previous to pupating, the larvæ, by twisting and twirling, managed to bury themselves and scoop out a small oval chamber, in which they changed to pupæ. Some of these I ruptured in digging up, but in others observed the larval skin cast and the pupa evolved. At first the legs were difficult to discern, as they scarcely projected beyond the body. In the course of a week the wings and eyes began to darken, and the leg-sheaths were more distinct; the abdomen, too, and the dark dorsal marks became visible, until, just a month after pupating, I bred six of the female flies. These, together with my original photograph of the injured stalks, I forwarded to Mr. C. O. Waterhouse, who placed them in the hands of Mr. E. E. Austen, the Dipterist at the Natural History Museum, who very kindly searched out the true name—viz. *Clinodiplosis equestris* (of Wagner)—whose figure of the injured stalk agreed in every respect with my photograph. It appears that Wagner obtained his first specimens in 1865 and 1866 from Fulga, Cassel, Germany, but it has not been much heard of since that time.

Being anxious to learn all I could of this extraordinary "pest," I determined to visit the infected field near Tenby. On June 23rd Mr. and Miss Mainland visited the field, and observed

a vast number of midge-like flies swarming in the ridges (the field having been ploughed and potatoes were then growing). A high wind was blowing, making capture of the flies a very difficult matter; however, a male and two females were caught, and sent on to me. I recognized the similarity of colour on the abdomen of the female, but could not then say positively that these flies had emerged from the red pupæ, though I thought they had. Nothing more was seen of this great multitude of flies.

On July 9th I went down to Tenby, where, by the kind hospitality and guidance of Mr. Mainland, as well as the courtesy and assistance of Mr. Cole, upon whose field this pest appeared, I obtained a supply of the larvæ and pupæ by simply using my fingers to dig them up, their red colour making them very conspicuous objects in the bright sunlight. I also swept a number of female flies from the rank herbage around the field. These, as well as the three caught by Mr. Mainland, were identical with those I bred.

Up to the time of writing (Aug. 11th) nothing has been heard of its re-appearance, about which the Board of Agriculture, with its long list of "inspectors," appears not to have taken any more serious interest than when first informed of its presence in the wheat-stalks. The only time when it could and ought to have been burned in the field, the wheat was left to rot, and the larvæ were allowed to enter the earth and there remain to complete their transformations.

If human "Boards" are idle, *insects* are not, and by this neglect and ignorance there is now present with us (in ambush, maybe) a vast army of devastating insects which may yet make their presence felt; for, unlike the Hessian Fly, the Tenby pest can and has successfully passed through a very trying English winter.

THE LARGE "COPPER," ITS HABITS, AND ONE OF ITS PRESENT HAUNTS.

By W. G. Sheldon, F.E.S.

I suppose there is no butterfly that has a greater attraction for the average British lepidopterist than our long lost glory, *Chrysophanus dispar*, and this species was one of the reasons that turned my steps towards the Danube this summer.

On the morning of June 1st last, at the early hour of eight o'clock, I walked out of the little wayside station of Kamaraerdo, some few miles south-west of Budapest, where I had been most kindly conducted by Professor Schmidt to see *C. dispar* alive. The country was very different in character to that frequented

by it in Britain, years ago, probably largely in consequence of the partial cultivation of its haunts. A valley some half-mile in width, the sides gently undulating up one or two hundred feet to its vine-clad crest on one side, and to the locally famous Budapest national playground, the Kammerwald, on the other. Except for a narrow strip at the bottom of varying width, the slopes were taken up by cultivation, and produced, in addition to grapes, luxuriant crops of wheat, barley, rye, sainfoin, potatoes, and maize; the remaining uncultivated portion being the present stronghold of *C. dispar*. Centuries ago this had been no doubt a quaking, undrained, reedy bog, where the food-plant flourished luxuriantly and the outflow from which found its way to the mighty Danube close by. Modern improvements had changed all this; down the centre ran a ditch, willow-planted, which had drained the water off, and into this ditch emptied at intervals smaller channels, each one of which played its part in the general scheme. This drainage system had converted the surface, leaving it moist indeed, but firm and covered with a thick crop of coarse grass, intermixed with flowering plants, amidst which the great waterdock grew abundantly in places.

The sun shone brightly that June morning, and we had not got ten yards from the railway station, when slowly flying along the grassy side of a ditch I saw my first large "copper" in the flesh, var. *rutilus* of course, but a very different object to the rather puny butterfly one usually gets from a dealer if a specimen is purchased; for, next to our own peerless type, the Budapest is certainly one of the finest, if not the very finest, form to be found anywhere. My largest male and female expand respectively 44 mm. and 45 mm., as against the 46 mm. and 49 mm. expanse of my largest British specimens.

There is no mistaking *C.* var. *rutilus* on the wing for any other European butterfly; the unique coloration identifies it at once. It has very similar habits of flight to the other European species of the genus, the males usually flying briskly but not fast over the long grass, with a jerky movement common to most of the Lycænidæ, searching for the females; if another male is approached, either flying or settled on the grass, the two will rise in the air and fight together for a few moments, then separate and each pursue its way. It does not seem to be partial to resting on, or sucking at, the numerous flowers that grow in its haunts. I saw two or three specimens at rest on one flower or other, but these were quite the exception; it is very fond of, especially during the afternoon, settling on a grass stem, and opening its wings to their full extent to enjoy the gratifying warmth of the sun's rays. It is then a magnificent object, brilliant beyond one's power of imagination, a patch of living, sparkling, ruddy gold; but even a study of the brilliant upper side does not reveal all the glory of *C. dispar*. If you see

a male approaching, flying slowly towards you over the long grass, do not be in a hurry to effect a capture, but watch, and as it passes you will see the sparkling gem-like, red gold, upper side, mingle with the delicate blue-grey under side, and form a natural kaleidoscope, a dream of colour well-nigh incomparable. Certain other species of European "coppers" are brilliant and most beautiful, but there is something indescribable about *C. dispar* that, to my mind, places it in a class by itself for beauty.

The female is, of course, not so brilliant an object. She is generally to be found in some corner away from the usual haunts of the male, presumably after impregnation: one frequently observes her at rest during the morning, or she may be disturbed out of the herbage. During the afternoon she is usually seen flying slowly and steadily over the grass in search of the food-plant.

One gets the impression that *C.* var. *rutilus* is only here for a time, for the whole of the herbage is cut for forage every season when the young larvæ of the first brood are feeding, and it is difficult to understand how any large proportion can reach maturity. Some of the examples I captured were very small, one expanding only 28 mm., evidently the result of insufficient nutrition.

The melodious fluting of the golden oriole, and the unmistakable "Hoo, hoo, hoo," of the hoopoe, two of our rarest and most beautiful birds, now alas, like the large "copper," extinct with us, or visiting us only casually, added greatly to the interest and charm of a red-letter day in one's entomological life.

August 19th, 1909.

THE FOOD-PLANT OF *LYCÆNA* (*LATIORINA*) *ORBITULUS*.

By T. A. Chapman, M.D.

When I made the observations recorded in the 'Entomologist' for last May on this subject, I felt much doubt as to whether *Androsace vitaliana* was *the* food-plant of *L. orbitulus*. Although it was unquestionably the food-plant at Binn, it might be, after all, only *a* food-plant, one amongst others. This doubt was based on the fact that my memories of the various places in which I had met with *orbitulus* were unaccompanied, as a rule, with any recollection of *Androsace vitaliana*. This plant is, however, very inconspicuous, except when in flower, and as *orbitulus* flies after the flowering is over, it seemed quite possible that the *A. vitaliana* was really *the* food-plant.

Memory is not very trustworthy on a negative point like this, so that my doubts were not clear enough to justify me in expressing them when I wrote out the notes referred to. I,

however, determined to investigate the point on the first opportunity. This opportunity arrived this summer, when I observed *L. orbitulus* at several Swiss stations, and at Arolla met with it in sufficient numbers to enable me to follow the matter up. In none of these localities could I find any *Androsace vitaliana*; it was therefore evident that the food-plant of the butterfly in these localities must be some other species. The butterflies were not plentiful or the weather favourable enough to make the investigation an easy one, and I had to spend a whole day and portions of several others before I could satisfy myself as to the correct solution. In fact, I did not succeed in seeing one specimen lay an egg, but I found the females of *orbitulus* were always attracted to, and paid special attention to, one plant, and on one occasion, and perhaps on a second, an egg appeared about to be laid, but actually it was not done. The plant proved to be *Soldanella alpina*. Butterflies in captivity laid freely on this, and the young larvæ now hatched eat it readily.

It is no doubt a fact well known to botanists, but to me it was quite a discovery to find that *Soldanella alpina* was an abundant plant over large tracts of the alpine pastures between 6000 and 8000 ft., forming quite an appreciable portion of the herbage. The ordinary tourist, from whom botanically the average entomologist can hardly be differentiated, looks on *Soldanella* as only occurring at very high elevations (8000 to 9000 ft.), and near to snow, and then rather sparingly. This is true, however, only of plants in flower in high summer, say July; I must confess to having had some such ideas.

The plants at lower elevations must flower very early. Not only the flowers, but also the fruits (if any), had disappeared in the haunts of *orbitulus* at the end of July.

Soldanella alpina is therefore the food-plant of *L. orbitulus* at many, if not a majority, of its habitats. On the *Soldanella*, as on the *Androsace*, the larva lives on the leaves and not on the flowers; though assuming, as seems probable, that it hybernates half-grown and feeds up in the spring, it may at that time attack the young inflorescence.

Unfortunately both my plants and larvæ have suffered by the unavoidable ill-usage of travel, and I much doubt if my material will enable me to carry the life-history further than I did last year.

Soldanella, like *Androsace*, belongs to the Primulaceæ, so that it seems very probable that *L. orbitulus* may also feed on some other plants of that order, Androsaces or alpine Auriculas. Both plants have thick fleshy leaves, and the larva bores into these and scoops out the parenchyma through a small hole, much as a Coleophora would do, or as the flower-buds are treated by the young larvæ of *argiolus*, *bœtica*, and other flower-eating Lycænids.

Betula, Reigate: August 16th, 1909.

ABERRATIONS OF *VANESSA URTICÆ* AND *V. IO*.

By T. Reuss.

Fig. 1.—*V. urticæ* ab. *luna*, n. ab.

Fig. 2.—*V. io*, ab.

I would like to record that on the 26th of July I bred a variety of *V. urticæ* L. (Fig. 1), which showed the following varietal characters :—

Upper side: on the fore wings there are only three blue lunules in the median part of the black marginal band, the four apical and the two lunules of the inner angle being replaced by black. The yellow spot between the second and third costal blotches is crossed with black. Hind wings: again in the black marginal band the four (in the right wing three) blue lunules of the costal and median part are either very faint or have entirely disappeared. The first two lunules of the four in the anal angle coalesce and form a large conspicuous blue crescent; the other two lunules are normally developed. The dark orange belt is narrowed and clouded with black in the costal part. Under side: slightly darker than normal; the crescent on the hind wings is conspicuously marked. The parts of the facies not mentioned are normal.

It is of interest to note the development of the blue lunules in this variety as compared with other forms in which reversely the costal (apical) lunules are favoured at cost of the anal lunules (*io*-formity, see 'Ent. Record,' pt. 4, 1909, plate vii).

On the 8th of August I bred a variety of *V. io* from wild Hertfordshire larvæ, in which the ocellus of the hind wings is disintegrated into three distinct bright blue lunules (Fig. 2). On the right hind wing a fourth blue spot is marked (as also in many otherwise normal specimens of *io*), and the place of a fifth spot is indicated—thus the possibility of a chain of lunules like in *V. urticæ* is suggested. The normally yellow parts of the fore wings are narrowed and grey in colour; the whole breadth of

the ocellus is suffused with bright metallic blue-violet; under side of hind wings suffused with yellow scales along the veins below the discal cell in the same manner as can be seen in many aberrations of *urticæ*.

AN UNUSUAL PHASE OF VARIATION IN LEPIDOPTERA.

Spilosoma menthastri, ab.

This unique aberration of *Spilosoma menthastri* was taken by Mr. Brown (one of the gamekeepers of my brother-in-law, Frank Percy, Esq.) on Ranworth Broad, Burlingham Hall, Norwich, on June 21st, 1909, and sent to me.

Jos. F. Green.

West Lodge, Blackheath.

[In the figure of this remarkable specimen it will be noted that, although typical on the right side, aberration in the direction of ab. *walkeri*, Curtis, is strongly exhibited on the left fore wing.—R. S.]

Zygæna trifolii, ab.

The above exceedingly curious insect was reared during the past summer by Mr. Sydney Thorne, of Bournemouth. As regards the right side it is a typical *Zygæna trifolii*, but on the left side all the markings are confluent, and thus forms the elongate blotch-like mark characteristic of the uncommon ab. *minoides*, Selys.

Among some specimens from Esher, collected in 1900, in my collection, is a female that, so far as concerns the right fore wing, is typical. On the left fore wing, however, spots 3, 4, 5, are confluent, and there is a red dash from 3 almost effecting a junction with the united basal spots (1, 2). Two other specimens (males) from the same locality and taken in the same year may be mentioned as peculiar. Each of these has a small red dot before spot 4, on the left fore wing; in all other respects these examples are typical.

RICHARD SOUTH.

DESCRIPTIONS OF THREE NEW SPECIES OF *CETONIIDÆ* FROM THE INDIAN EMPIRE.

BY OLIVER E. JANSON, F.E.S.

Diceros gracilis, n. sp.

Body elongate and narrowed behind, shining black, sides of the thorax with an ill-defined red marginal band more or less dilated behind; elytra with a large pale yellow central patch, pygidium and apical segment of the abdomen red. Head sparsely punctured at the base, a little impressed and obliquely striated on each side between the eyes; clypeus slightly dilated in front, rather coarsely punctured, the side margins raised, the apex slightly rounded and with the margin evenly reflexed. Thorax finely and sparsely punctured, a large transverse impression on each side at the base with coarse horseshoe form punctures. Scutellum with remote fine punctures or almost impunctate. Elytra with eight regular rows of horseshoe form punctures which do not extend to the apex, the sutural row strongest and the two outer rows indistinct in some specimens, the apical part strigose. Pygidium strongly transversely strigose. Under side and legs strigose and coarsely punctured; mesosternal process very long and curved inwardly towards the apex; abdomen very deeply and broadly impressed in the male, convex and more strongly punctured in the female; anterior tibiæ with a strong subapical marginal tooth in both sexes. Length, 12½–13½ mm.

Tharrawaddy, Burma, and Maria Basti, Brit. Bhotan (coll. Janson).

The small narrow form, punctured impressions on the thorax and strongly punctured elytra of this species readily distinguish it from *D. cuvera*, Newm., to which it is most nearly allied, and its simple unarmed clypeus at once separates it from *D. childreni*, Westw. The size of the yellow elytral patch varies a little, but is very similar to that in the latter species.

Tæniodera idolica, n. sp.

Black, above dull with short grey pubescence, under side and legs shiny and with longer and denser pubescence. Above with ashy-grey markings disposed as follows: on the head two longitudinal

bands; on the thorax a marginal band on each side from a little before the middle to the basal angles and a large Y-form central mark extending from the anterior angles to the tip of the basal lobe where it dilates into a large round spot; on the scutellum a central stripe dilated at the base; on the elytra two transverse spots at the sides and a broad sutural band, forked and following the margin of the scutellum to the base, dilated before and again behind the middle and continued along the apical margins; on the pygidium a very broad central band. The under side broadly marked with ashy-grey at the sides, the femora with marginal bands of the same colour. Head slightly shiny, densely and coarsely punctured, the clypeus dilated and strongly rounded in front, the apical margin reflexed and broadly and shallowly emarginate. Thorax rounded at the sides, broadest a little before the middle, the side and basal margins slightly raised and shiny, coarsely and closely punctured. Elytra with a distinct median carina and rather indistinct punctured striæ. Pygidium closely but indistinctly punctured. Under side and legs coarsely punctured; mesosternal process short, obtuse, cariniform; abdomen slightly flattened, but not grooved, in the centre; posterior tibiæ very strongly produced, keeled, and with a tuft of long yellow hair on the inner side at the apex. Length, 14 mm.

Maymao, Upper Burma (coll. Janson).

Allied to *T. zebræa*, Fairm. (of which I have a co-type from the author), but smaller, the head more closely punctured, the clypeus broader, more rounded at the sides, and with the apical margin reflexed and less deeply notched, the thorax more narrowed behind, the elytra more truncate at the apex, the under side less closely punctured, the abdomen in the male not impressed, and the posterior tibiæ of a quite different form. The markings are somewhat similar but less extended, the marginal bands on the thorax are not directed inwardly behind, there is no humeral spot on the elytra, and the band on the pygidium is not dilated at the base. The name given is in reference to the idol-like figure of the markings on the elytra.

Tæniodera indica, n. sp.

Black or piceous, above opaque with sparse short golden pubescence and pale ochreous or yellowish markings disposed as follows: on the head two longitudinal bands; on the thorax an oblique vitta on each side and a large Y-form central mark; on the scutellum a broad stripe slightly dilated at the base; on the elytra a small spot above the shoulder, two transverse lateral spots, a small mark at the apex of the scutellum, an irregular transverse mark about the middle of the suture, and a large apical mark extending a short way along the suture, where it is more or less dilated; on the pygidium a central spot or vitta. Under side shining, with golden pubescence and broad pale ochreous bands at the sides. Head very coarsely punctured, a smooth longitudinal median carina at the base; clypeus dilated and rounded at the sides, shallowly emarginate at the apex. Thorax broadest before the middle, where it is distinctly broader than

long, moderately lobed and sulcate behind, the entire surface with a very dense coarse punctuation, which becomes confluent and rugose towards the sides, the side margin behind the middle slightly raised and smooth. Elytra strongly costate along the centre, depressed and striated near the suture, punctured at the base and sides, slightly rounded at the apex. Pygidium convex, coarsely strigose and rugose. Under side strigose and with coarse semicircular punctures on the abdomen; mesosternal process narrow and obtuse; anterior tibiæ with two strong lateral teeth. In the male the abdomen is slightly impressed, and the posterior tibiæ are keeled, slightly curved, and with dense long golden pile on the inner side. The female is less opaque above, and has the Y-form thoracic mark widely interrupted in the middle. Length, 15–17 mm.

Khasia Hills and N. Manipur, Assam (coll. Janson).

Allied to *T. zebræa*, Fairm., but with the clypeus broader, more rounded, and less deeply notched, the thorax much broader, the elytra less rounded at the apex, the markings different, and, in the male, with the abdomen more lightly impressed, and the posterior tibiæ of a different form.

CURRENT NOTES.

By G. W. Kirkaldy.

1. Miyake, T.: "Description of a New Species of the Genus *Latirostrum*, with Remarks on the Generic Character and the Significance of the Long Palpi," Bull. Coll. Agr. Tokyo, viii. 149–51, 1 fig. (April, 1909). Lepidoptera.
2. Id.: "A Revision of the Arctianæ of Japan," *op. cit.* 153–74, figs. 1–6 (April, 1909). Lepidoptera.
3. Japha, A.: "Die Trutzstellung des Abendpfauenauges" (*Smerinthus ocellatus* L.), Zool. Jahrb. Abt. Syst. xvii. 321–8, pl. 12. Coleoptera, Lepidoptera.
4. Kosminsky, P.: "Einwirking äusserer Einflüsse auf Schmetterlinge," *op. cit.* 361–90, pls. 13–7. Lepidoptera.
5. Blunk, H.: "Färbungsvariation bei *Dytiscus marginalis*, Linn.," Zool. Anz. xxxiv. 337–45 (June 1, 1909). Coleoptera.
6. Davis, W. T.: "Owl Pellets and Insects," Journ. New York Ent. Soc. xvii. 49–51 (June, 1909). Coleoptera.
7. Lovell, J. H.: "The Colour Sense of the Honey Bee—Is Conspicuousness an Advantage to Flowers?" Amer. Nat. xliii. 338–49 (June, 1909). Hymenoptera.
8. Ewart, A. J.: "The Negative Phototaxis of Blowfly Larvæ," Victorian Nat. xxiv. 61–2 (July, 1907). Diptera.
9. Jacobson, E. "Notes on Web-spinning Ants," *op. cit.* 36–8 (June, 1907). Hymenoptera.
10. Daw, R. P.: "On the Origin of Entomological Names," Journ. New York Ent. Soc. xvii. 51–6 (June, 1909).

11. Pomona Journal of Entomology I.: pp. 1–25, fs. 1–25 (March, 1909).
12. Poulton, E. B.: "Essays on Evolution, 1889–1907," pp. l–lviii and 1–479. (Oxford, 1908.)
13. Newcomb, W. W.: "A Summer with *Chrysophanus dorcas*, Kirby," Can. Ent. xli. 221–9 (July 7th, 1909). Lepidoptera.
14. Maxwell-Lefroy, H.: "Eri or Castor Silk," Agr. J. India, iv. 125–33, pls. 6–13 (April, 1909). Lepidoptera.
15. Walton, W. R.: "An Illustrated Glossary of Chætotaxy and Anatomical Terms used in Describing Diptera," Ent. News. xx. 307–19, pls. 13–16 (July, 1909).

Miyake (1) describes a new species from Japan of the Noctuid genus *Latirostrum*, and remarks, "Baron Takachiho captured the moth in a forest on Mount Hikosan, one of the highest mountains in Kiushiu. He says the moth was resting on a leaf of a certain tree, with its long palpi extended forwards so as to imitate a spine in a very perfect manner, and he supposes that when it settles on a branch of a tree it may pass unobserved even by keen eyes, showing us the significance of the long palpi of this species." The same author (2) revises the Japanese Arctianæ, enumerating, with synonymy, thirty-two species, with a table of distribution; six species are figured, the larvæ of nine briefly described, and the food-plants of several listed, no less than seven being harboured by mulberry. Three new species are described, the previously known forms having apparently been described at length in Japanese in the extra-reports of the Imperial Agr. Sta. 22 (1906).

Lovell (7) reviews the subject of colour-sense in insects with relation to flowers. His paper is not very amenable to summarisation, but, briefly, his results confirm the usual generally adverse position to Plateau's opinions.

Japha (3) discusses the "defiance-attitude" of *Smerinthus ocellatus*, with a coloured plate. Kosminsky (4) discusses the influence of external conditions on Lepidoptera. Blunk (5) deals with colour variation in *Dytiscus*.

A new entomological periodical has appeared in California (11); the first number deals principally with Aphididæ and Coccidæ.

It is surprising not to have seen a review in the 'Entomologist' of Poulton's collection of Essays on Evolution (12); these are partly reprints of papers read or delivered before various meetings, but also largely new, the greater part being directly or indirectly connected with entomology, the following especially: "Thomas Henry Huxley and the theory of Natural Selection" (pp. 193–219); "Natural Selection the Cause of Mimetic Resemblance and Common Warning Colours" (220–70); "Mimicry and Natural Selection" (271–92); "The Place of Mimicry in Scheme of Defensive Coloration" (293–382); with a

classification and index of the examples of mimicry quoted (383–479). One of the notable mechanical features in the text is the copious index of 85 pp.

British lepidopterists will probably be interested in Newcomb's detailed observations on the habits of a United States *Chrysophanus* (13). Maxwell-Lefroy discusses at some length the Castor Silkworm, *Attacus ricini* (which is probably the domesticated form of *A. cynthia*). The larvæ differ from all other silk-producing Indian larvæ in that they do not feed on mulberry, but on castor leaves; the cocoon is not closed and is not reel-able in the same way as other kinds. On the other hand, the cocoons do not require to be killed to prevent the egress of the moth, as one end is closed only with converging loops of silk (14).

ON TWO NEW GENERA AND SEVEN SPECIES OF CHALCIDIDÆ (EUCHARINÆ) FROM BORNEO.

By P. Cameron.

Ancylotropus, gen. nov.

♂. Antennæ twelve-jointed, the joints elongated, pilose. Parapsidal furrows distinct, complete. Scutellum large, triangular, the apex prolonged into a broad spine, two-thirds of the length of the basal part, keeled down the centre, the apex slightly incised. Thorax rugose. Abdominal petiole long, cylindrical, as long as the rest of the abdomen, flat above, the sides margined. The right mandible with four teeth, the basal not so distinct as the others; the outer tooth less, but dilated at the base. Abdomen projecting upwards. Stigmal branch short, thick. Face raised in the centre, the raised part narrowed into a keel below; the clypeus with a large fovea on either side above. The head is broader than it is long, and is a little wider than the thorax.

In the table of Ashmead (Mem. Cairn. Mus. i. 269) this genus runs to near *Psilogaster*, which has the antennæ eighteen jointed, and the apex of the scutellum is rounded. The form of the scutellum in *Ancylotropus* is pretty much as in *Saccharissa*, but that genus has the antennæ eighteen-jointed.

Ancylotropus cariniscutis, sp. nov.

Head and dilated part of abdomen black, the thorax dark blackish blue, with coppery and violaceous tints, the antennal scape, pedicle, palpi, tegulæ, and legs, except the coxæ, yellowish testaceous, the flagellum of antennæ dark testaceous at the base, the apical joints blackish; wings hyaline, the nervures testaceous. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

Basal two joints of antennæ bare, the rest densely covered with long fuscous pubescence. Face and clypeus smooth, the vertex and front longitudinally striated, the striæ stout and clearly separated. Mesonotum and scutellum somewhat strongly reticulated, the scutellum more widely than the mesonotum; the centre, and, less strongly, the sides of scutellar spine keeled, the space between the keels with a few transverse striæ. Metanotum coarsely irregularly reticulated. Propleuræ coarsely reticulated, the mesopleuræ more finely obliquely reticulated; the metapleuræ strongly regularly reticulated and densely covered with white pubescence. Sides of abdominal petiole with two or three stout longitudinal striæ. The mesopleuræ less densely covered with white pubescence than the metapleuræ. Wings shortly, closely ciliated. The metapleuræ are broadly rounded at the apex.

ELTOLADA, gen. nov.

Antennæ eleven-jointed, simple in the male, the joints elongated, cylindrical, pilose; longer than the body, in female not much longer than the head and thorax united, the basal joint elongated, as long as the following two united. One mandible edentate, the other with a long apical followed by two short teeth. Parapsidal furrows distinct. Scutellum large, almost semicircular, the apex prolonged into a process which is as wide as long at the base, followed by two roundly curved forks. Abdominal petiole as long as the thorax, and longer than the rest of the abdomen in both sexes, narrow, cylindrical, of equal width; the dilated apical part is turned upwards. Marginal and post-marginal vein thickened, the latter half the length of the former and narrowed towards the apex, stigmal vein short, sessile, as long as thick.

The simple, non-flabellate antennæ might ally this genus with *Psilogaster*, which, however, may easily be known from it by the scutellum not being bidentate. The simple antennæ in the male separate it from *Stibula* and *Schizaspidia*; from the latter it may further be known by the very much longer abdominal petiole, and by the thickened marginal and post-marginal nervures, and the very short, thick, stigmal vein.

Eltolada trimaculata, sp. nov.

Head blue, the mandibles and palpi yellowish testaceous, the basal three joints of the antennæ and the apical two testaceous, the apical more rufous in tint than the basal. Thorax yellowish testaceous, a large blue and violaceous mark, almost semicircular, but longer than wide, on the basal half of the central lobe, a smaller oblique one, longer than wide, its base rounded, the apex straight and oblique on the two lateral, a line on the apex, touching the scutellum, a small triangular mark on the apex of the scutellum. Length, 5 mm.

Kuching, Borneo; May (John Hewitt).

Sides of the head, from the base of the ocelli to the middle of the front, longitudinally striated, the striæ strong and clearly separated, the centre, immediately under the antennæ, with three curved transverse striæ. Malar space to near the bottom stoutly obliquely

striated. Clypeus triangular, bordered by wide deep furrows. There are some striæ between the ocelli. Thorax coarsely reticulated, the metanotum more widely than the rest. Mesopleuræ smooth, with a broad band of stout longitudinal striæ at the base. The reticulations on the metapleuræ are long and narrow, and, at the base, are in three rows, the basal having the reticulations longer than the others. There is a crenulated furrow, with stout raised edges, down the centre of the scutellum. The apical forks of the scutellum are straight, obliquely diverging, and are as long as the basal part.

Eltolada leucopoda, sp. nov.

Head and thorax blue, the blue on the mesonotum tinged with green and darker coloured, the blue on the pleuræ slightly tinged with violaceous, the scutellum black, tinged with green. Abdomen black, the ventral surface brown. Antennæ testaceous, tinged slightly with rufous; the legs whitish yellow, the coxæ blackish to near the apex. Scutellum large, the basal part forming a semicircle; the basal part of the spine longer than the apical forks, which are roundly curved, and are for the greater part brownish. Wings hyaline, with a fuscous cloud, longer than wide and rounded at the apex, at the stigma, the apex is faintly clouded, the nervures black. ♂. Length, 4–5 mm.

Kuching, Borneo (John Hewitt, B.A.).

Antennæ densely covered with longish fuscous pubescence. Sides of the face to below the middle obliquely striated; the depressions at the sides of the clypeus large, deep. The face in the centre above with curved, transverse striæ; malar space stoutly closely obliquely striated. Ocellar region longitudinally, the occiput transversely, striated. Thorax, except the centre of mesopleuræ, reticulated; the metathorax more and the mesopleuræ less strongly than the rest, the scutellum not so strongly as the mesonotum. Abdominal petiole longer than the rest of the abdomen.

Schizaspidia cæruleiceps, sp. nov.

Dark green, the head and the dilated part of the abdomen blue, the occiput green, the antennæ and legs testaceous, the femora and hind tibiæ infuscated; wings hyaline, the nervures testaceous. Scutellum larger, longer than it is wide at the base, narrowed towards the apex, which is not quite half the width of the base; the apical forks wide, curved, narrowed towards the apex, which reaches close to the base of the apical fourth of the abdomen; it is longitudinally reticulated, the transverse keels finer than the longitudinal, the reticulations on the apical forks finer and more irregular than on the basal part. Mandibles testaceous. ♂. Length, 4·5 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head smooth, the sides of vertex widely, weakly striated, the malar space finely, irregularly striated. Pro- and mesonotum transversely reticulated, the transverse striæ stronger than the lateral. There is a transverse furrow at the apex of the mesonotum; a deep curved depression at the base of the scutellum. The lower part of the projecting apex of the scutellum reticulated; the metanotum is more

strongly and closely reticulated. Propleuræ with large irregular reticulations; the meso- and metapleuræ more closely and strongly reticulated. Abdominal petiole weakly, irregularly striated; the apical segments brown. Thorax covered with short white pubescence, which is longer on the metanotum.

Eucharis leviceps, sp. nov.

Dark blue, the dilated part of the abdomen almost black; antennal scape yellowish testaceous, the flagellum densely pilose, fuscous, the basal joints testaceous. Mandibles testaceous; palpi pallid yellow. Prothorax smooth. Basal slope of mesonotum closely, rather strongly, transversely striated, the rest closely reticulated, the scutellum more coarsely, irregularly reticulated. Metathorax smooth, the base with a crenulated furrow. Propleuræ and base of mesopleuræ smooth, the raised central part of mesopleuræ closely reticulated. Legs pallid yellow, the femora and the hind coxæ black, the base of the four anterior coxæ infuscated. Wings hyaline, the nervures pallid testaceous. ♂. Length, 4 mm.

Kuching, Borneo (John Hewitt, B.A.).

The central part of the face is raised, and is bordered by distinct curved furrows.

Eucharis purpureoventris, sp nov.

Bright blue, the dilated apical part of the abdomen purple-violaceous, the antennal scape, mandibles, palpi, four front legs, and the hind tibiæ and tarsi and trochanters, pallid yellow; the hind coxæ and femora dark blue. Flagellum of antennæ densely pilose, fuscous, darker towards the apex. Wings clear hyaline, the nervures pale. ♂. Length, 3 mm.

Kuching, Borneo (John Hewitt, B.A.).

Head smooth and shining, the centre of the face and the sides of the clypeus margined by deep, wide furrows, the furrows at the face converging, at the clypeus diverging, below. Pro- and mesonotum with scutellum closely reticulated. Metanotum smooth, the centre bordered by wide, converging, crenulated furrows, the centre being thus narrowed towards the apex. Propleuræ smooth, the centre with a curved, weakly crenulated furrow. Mesopleuræ smooth, the centre with a wide furrow, which turns up obliquely at the apex; the base is composed of a large oblique and a smaller oval fovea, the rest is irregularly striated; the apex is bordered by a weakly crenulated furrow, curved and dilated above. Metapleuræ smooth, the furrow shallow, wide, weakly crenulated. Abdominal petiole not much longer than the rest of the abdomen.

Eucharis pallidipes, sp. nov.

Dark blue, the pleuræ with violaceous tints, the abdomen black, the antennal scape, palpi, and legs pallid yellow, the basal half of the femora infuscated; flagellum of antennæ blackish fuscous; wings hyaline, the nervures fuscous. ♂. Length, 3 mm.

Kuching, Borneo (John Hewitt, B.A.).

Front and vertex aciculated, the rest of the head smooth and shining. Mesonotum irregularly longitudinally rugosely punctured. Scutellar depression wide, the middle more finely rugosely punctured than the mesonotum itself, the sides with stout, clearly separated striæ. Scutellum large, broadly rounded, rugosely punctured, the basal slope irregularly longitudinally striated. Metanotum closely, irregularly reticulated. Propleuræ, except at the base, irregularly longitudinally striated. Middle of mesopleuræ reticulated, the upper basal part closely longitudinally striated, this striated part being raised and light blue. Hind coxæ blue, and finely, closely striated. Abdominal petiole about one-quarter longer than the rest of the abdomen.

NOTES AND OBSERVATIONS.

Abraxas grossulariata ab. lacticolor in Warwickshire.—As the distribution of varieties in this county seems very little worked, it might be well to record that on July 23rd a specimen of *A. grossulariata* ab. *lacticolor* emerged in my breeding-cage. The specimen, which was unfortunately a cripple in one wing, differed from the example figured in "South" in having the black markings on the costa and fringe slightly less obsolete. The insect was bred from a larva found at Rugby, fed on hawthorn.—P. W. Whitley; Brantwood, Halifax.

Eupithecia togata going over two Seasons in Pupal Stage.—I had a similar experience to that of Professor Meldola (*antea*, p. 182) with pupæ of *E. togata*, obtained, I expect, from the same source. Out of twelve pupæ, five emerged last year, and six in the early part of June, 1909. They were exceptionally fine specimens. I had concluded that the pupæ were dried up, as they were exposed to strong sunlight, whenever this somewhat rare phenomenon took place.—G. Bertram Kershays; West Wickham, Kent, July 27th, 1909.

Spanish Chestnut as a Food-plant of Thecla quercus.—On May 31st (Whit Monday) of the present year I found a larva of *T. quercus* on a stub of Spanish chestnut. The larva was about three-parts grown and fed up well, in due course turning into a pupa, whence emerged a fine female butterfly on July 21st. I have never heard of this tree as a food-plant of *T. quercus*; in fact, in my experience, very few larvæ seem to take a fancy to it.—Geoffrey Meade-Waldo; 17, Douglas Mansions, Cromwell Road, S.W.

Rearing Chrysophanus rutilus in England.—With reference to the note on *Chrysophanus dispar* in the 'Entomologist' for July, the following experiment, conducted by Mr. Newnham (since dead, I believe) at Church Stretton, may be of interest. Mr. Newnham procured a large frame, and in this he grew the food-plant of *C. dispar*. He then placed within the frame some larvæ of *C. rutilus*; the imagines resulting were allowed to breed in a moist atmosphere. At the end of two or three years, a form much nearer *dispar* than

rutilus resulted. Unfortunately a severe winter ended the experiment. I can vouch for the truth of this statement, having had it described by Mr. Newnham, who showed me the series of specimens about the year 1898.—Ralph Rylands; Highfields, Bidston Road, Birkenhead, July 5th, 1909.

Peronea variegana and Aberrations in Durham.—In 1908, whilst staying at Bishop Auckland, in Durham, during early July, I found a few larvæ of *Peronea variegana* between leaves of a pear-tree growing up the end wall of a house. Among the seven or eight moths reared therefrom, only more or less greyish specimens and one example of ab. *asperana* occurred. About the middle of July last I was able to visit the same town again, and on this occasion secured a nice lot of larvæ of the species from the pear-tree. The majority of these attained the winged state, the bulk of the specimens were of the blackish marked grey form known as *cirrana*, and it is curious to note that the first moth to emerge (Aug. 5th), as well as the last (Aug. 27th), are of this form. The typical form, and also. ab. *asperana*, are well represented, together with modifications of each of those forms and of the *cirrana* form. In addition there were seven beautiful white specimens of ab. *albana*, Westw., four of which emerged on August 12th, two others on the 15th of that month, and one on the 22nd. The original description of *albana* runs as follows:—"Measures 7 lines in expanse; fore wings silky white, with a few white tufts of elevated scales on the disc, the costal margin slightly brunneous, as well as the apical fringe; hind wings pale brown. Closely allied to *P. treueriana*, but that species has the costa destitute of the slender brunneous margin, and the disc has a few black scales scattered about near the tip." (Westw. & Humph. 'Brit. Moths,' ii. 162 (1851).)

I may mention that, although I refer my white specimens to *albana*, they differ from the type, which is in the National Collection, and from the above description, in having the costa of fore wings more distinctly marked with brownish; most of them are rather larger in expanse and the wings appear broader.—Richard South.

The Perpendicular Distribution of the Papilionidæ in the Himalayas.—I shall be obliged if any readers of the 'Entomologist' will supply further information respecting the approximate range of altitude of all Papilionides occurring in the North-western Himalayas, in order to fill up some of the gaps in the table on pp. 205–6. The following errata require correcting:—Page 197, line 2, for twenty-five read *seventy*-five. Page 199, line 12, also page 205, line 8, for *P. didoneus* read *P. aidoneus*. Page 205, line 4, for Papilionidæ read Papilioninæ; line 21, for *A. polyctor* read *Sarbaria polyctor*.—W. Harcourt-Bath; August 16th, 1909.

Entomological Club.—A meeting was held on July 5th, 1909, at the 'Hand and Spear' Hotel, Weybridge, Mr. G. T. Porritt in the chair. Other members present were Messrs. R. Adkin, Donisthorpe, Rowland-Brown, and Verrall. The additional guests were twelve in number, including two honorary members—Messrs. A. H. Jones and Sich.

CAPTURES AND FIELD REPORTS.

Orange Variety of Zygæna filipendulæ.—From some three dozen cocoons of *Z. filipendulæ* collected at Merrow, Surrey, in July, a fine specimen of ab. *aurantia*, Tutt, emerged on August 8th, the spots and hind wings being bright orange, the rest of the wings metallic blue.—E. S. A. Baynes; 120, Warwick Street, S.W.

Selidosema ericetaria in Scotland.—In 'The Moths of the British Isles,' I see that the only Scotch record for this moth is the Isle of Arran (1882). I took two male examples at the beginning of this month, on the marshy ground among the hills behind Mallaig, Inverness-shire.—E. S. A. Baynes.

Antithesia salicella in Warwickshire.—We have much pleasure in recording this somewhat local Tortricid moth for Warwickshire. We have taken it to-day (July 26th) beneath an old willow, on the River Avon, near Rugby. Last year we captured a single specimen (again on a willow) at Brandon, Warwick, on July 24th. There is also a specimen in the Collection of the Rugby School Natural History Society, labelled "2nd Aug. '98, N. V. Sidgwick." It is evident, therefore, that the insect is not rare in this county, though hitherto, apparently, it has been unrecorded. Barrett gives no Midland locality for it except Cheshire; but he states that it occurs as far north as Yorkshire and Durham.—P. A. and D. A. J. Buxton; Chigwell, Essex.

Sugaring a Failure.—I visited Cambridgeshire from middle of June to first week in July, and my experience was that moths were entirely absent, owing no doubt to the prevailing cold and wet. Conversing with a well-known collector at Bedford, his testimony coincided with my own experience. A general report would be interesting, so as to give an idea of other records.—E. Everett; Letchworth.

Acentropus niveus.—When taking my usual constitutional along the Westcliff front last night, I noticed a small *Acentropus niveus* excitedly spinning around, on the ground, under one of the electric light standards. I stooped to box it, and found that the cause of all the fuss, excitement, and endless gyrations was the presence of a female, which sex I had not previously seen, alive or dead, in this district.—F. G. Whittle; 7, Marine Avenue, Southend, August 16th, 1909.

Abundance of Nola cucullatella and Peronea variegana.—On July 20th, 1909, I walked through Richmond Park (Surrey) and noticed that *Nola cucullatella*, which is usually common there, was in greater abundance than in former years. The specimens were also of good size and nearly all in remarkably good condition. Every whitethorn of any size had several specimens at rest on the trunk or on the larger branches. I counted the moths on only one tree, and these amounted to ten. Among the Nolas were a few *Gelechia vulgella*, some *Swammerdamia lutarea*, and many worn *Blastodacna hellerella* (*Laverna atra*). Another common species which is attached

to whitethorn has also been, I think, more abundant this year than usual, or, one ought perhaps to say, is more abundant, as I believe *Peronea* (*Acalla*) *variegana*, the species I allude to, hybernates in the imago state. I have seen a great many sitting on whitethorn leaves in the hedges in Chiswick and Brentford. The parti-coloured and dark forms were equally common, but the browner variety was much scarcer.—Alfred Sich.

Plusia moneta in North Lincolnshire.—I took a fresh specimen of *Plusia moneta* on July 18th, 1909, in a garden at Limber, in North Lincolnshire.—E. A. Cockayne; 16, Cambridge Square, W.

Celastrina argiolus in Middlesex, &c.—In my previous note (*antea*, p. 186) I mentioned the fact that I had never seen an autumn example of this species here in all the years I have met with it common or otherwise in the spring. Yesterday (August 22nd), preparatory to a big shower, the sky was clear, and I noticed a female *C. argiolus* at rest on a flower-cluster of hydrangea; and a male flying rapidly over the lawn. With regard to the Pierids, reported by me as so common this year in Middlesex in May, and in Essex by Mr. Frohawk (*antea*, p. 213), I may add that they are even more abundant in this neighbourhood in the second generation, while on August 21st, on the beautiful Chiltern Hills between Kimble and Princes Risboro', they were flying in hundreds, *P. brassicæ* undoubtedly predominating. A fresh and numerous brood of *P. napi* was also much in evidence, while the scabious, thistles, and hawkweeds—this season in great luxuriance—were visited by the following:—*Pamphila comma*, *Thymelicus flavus* (worn), *Chrysophanus phlæas*, *Polyommatus corydon* (males just emerging, very late), *P. alexis* (one very fine female ab. = *cærulea-angulata*, Tutt), *P. astrarche* (fresh, very small), *Gonopteryx rhamni* (fine, just out), *Argynnis aglaia* and *A. adippe* (both in rags), *Vanessa io*, *Pyrameis atalanta*; *Epinephele jurtina*; *Aphantopus hyperanthus* (still in fair condition), and *Cœnonympha pamphilus*; all, except the "skippers" and the "whites," under normal size. On the flower-heads *Charæas graminis* was represented by single examples; and on a windy, bleak day in the middle of June I also observed, at the same spot, great numbers of *Adscita geryon* on the helianthemum, and not a few *Parasemia plantaginis*; butterflies, however, being conspicuous by their absence at that date.—H. Rowland-Brown; Harrow Weald, Middlesex.

Phryxus (Deilephila) livornica at Exeter.—I wish to record taking here, on July 27th, a dead male specimen of *P. livornica*, under an electric light standard in High Street. It was in fairly good condition.—F. Pope; 11, Portland Street, Newtown, Exeter.

Curious Place chosen by Triphæna pronuba for Ovipositing.—I have frequently noticed batches of ova deposited on the tarred stop-netting round our tennis-courts, but have never been able to actually see what insect chose so unpromising a place for the purpose. Recently, however, I was fortunate enough to observe a moth in the act of oviposition, and after allowing it to deposit about

fifty ova captured it, and found it to be the common Yellow Underwing. Wondering what would become of the young larvæ when they found themselves on so peculiar a "food-plant," I examined another batch of ova which had been laid some time previously, and found that after slowly eating so much of the egg-shell as was not attached to the tarred string, the larva spun a fine thread of silk and floated gently to the ground, presumably there to continue its life among the grass. It would be interesting to learn whether any other observers have noticed the moth doing the same thing in other districts.—HARRY ELTRINGHAM; South Shields.

[On July 23rd last I noticed a number of the ova of *Mamestra persicariæ* on some black thread hanging on the branches of a plum-tree in the garden. (The thread, it may be mentioned, had been put over the tree to protect the blossom from bird attack in the spring.) In one case the eggs were arranged in beautifully neat order, side by side, all down a loose end for about four inches of its length: in appearance this was not unlike a string of tiny beads. A shorter row of eggs was laid on a length of thread that was still stretched from one twig to another. This was cut off for examination, and was found to have some sixty eggs upon it; of these I kept about half. The larvæ hatched a few days later, and at first ate the foliage of the plum, but when supplied also with knotgrass and other weeds they seemed to lose their taste for plum. Larvæ also hatched out from the ova left on the thread in the open, and those that have so far escaped their enemies are no doubt feeding upon various plants in the garden. At all events I have failed to detect any on the plum-tree, although those from the eggs I kept are now (Aug. 27th) nearly full-grown.—R. S.]

ACRONYCTA ACERIS LARVA FEEDING ON LABURNUM. — *Acronycta aceris*, L. is not uncommon in this district and, though it occurs on sycamore, its favourite food-plant here appears to be horse-chestnut. Last autumn (1908) I took a very young Acronyctid larva off laburnum, which, as Mr. South suggested when I mentioned it to him, turned out to be that of *A. aceris*. Laburnum seems to be a strange food-plant for this species which, however, may be more of a general feeder than is usually supposed. When a species is exceptionally abundant it sometimes takes to unusual food-plants, but *A. aceris* was not more frequent than usual last season. I may also mention that from the early stage of the larva when I took it, and from the way in which it ate the laburnum leaves supplied to it, I have no doubt that the egg was laid by the parent on the laburnum-tree. I failed however to find any further larvæ of this species on the tree.—ALFRED SICH; Corney House, Chiswick, Aug. 18th, 1909.

LEPIDOPTERA IN EAST SUSSEX.—For the past four years it has been my good fortune to spend a portion of the month of August at the "ancient town" of Rye. It is a place known chiefly to artists and golfers, and has apparently received little attention from entomologists. Yet it is perhaps better situated as a locality for the insect-hunter than any other spot on the south-east coast. The town itself rises sharply above the river Rother, and is separated from the sea by a mile or more of salterns, the coast being bordered

by a long stretch of sandhills. Inland the country consists of the river valley—a rush-covered plain divided roughly into fields by ditches thick with reeds—and of well-wooded hills. Between these hills and the marshes lies the rock on which the town stands. Thus there is in its immediate neighbourhood a great variety of country, each district rich in the species peculiar to it. In addition, the town, which is very brightly lighted, serves as a beacon both to the moths which haunt the lowlands and to those bred on the wooded slopes. August does not usually appear to be a profitable month for entomology. Large numbers of common insects are about, but the choicer species have mostly disappeared. During my previous visits, apart from some sugaring on the coast, where in 1906 *Laphygma exigua* was common, and where I took *Leucania littoralis* in addition to *Agrotis valligera*, *A. tritici*, *Hadena chenopodii*, *C. cytherea*, *A. citraria*, and many others, and from light work among the reeds, I did very little. During the present year, however, things have been very much busier. Although I was only there from Aug. 1st to 16th, and could not devote much time to entomology, my list of captures contains many insects which were wholly unexpected. Probably the cold weather of June and July caused many species to postpone their emergence until late. The exceptional heat of early August must account for the heavy "rise" of moths which took place then. It seems most unlikely that the season has favoured the production of second broods; although there has been an abundance of green food, this would be more than counteracted by the low temperature of June and July. Delay in leaving the pupal stage seems to be the probable cause of the appearance of certain species in my list.

During the first part of my visit I spent most of my energies on the marshy salterns below the town. Here I found a place, overgrown with yellow *Galium*, in which *Mesotype virgata*, *Cledeobia angustalis*, and a few other species were swarming. Of the former the males were most numerous and in best condition on Aug. 3rd, while on Aug. 5th females were everywhere, and scarcely a male could be taken. On several nights I worked the reedy ditches and small reed-beds which are found all over the salterns, and the results, if not very striking, were at least not disappointing. The following species were taken:—*Nudaria senex* (common on Aug. 3rd; one on Aug. 9th), *Odonestes potatoria*, *Leucania straminea* (a few each night; it was not always easy for me to distinguish this species from *L. impura*, which was common, but the under side of *straminea* is a good guide when the insect is boxed), *Senta ulvæ* (one, very worn, on Aug. 3rd), *Luperina testacea*, *Miana furuncula*, *Noctua umbrosa*, *N. rubi*, *Acidalia emutaria* (not uncommon), *Schœnobius gigantellus*, *Chilo phragmitellus*, and *S. forficellus*. Though I did not myself take *S. chrysorrhœa*, a nice specimen was given to me which had been taken on Aug. 13th by Mr. J. S. Carter at Lydd. It was at light that the best results were obtained. Large numbers of insects came regularly into the house, and the few nights on which I searched the town lamps were richly productive. I will give the complete list of captures, adding particulars where such appear interesting:—*Sarrothripa revayana*, *Hylophila bicolorana* (one on Aug. 13th, not a perfect specimen), *Lithosia lurideola*, *L. griseola*, *Arctia caia*, *Cilix*

glaucata, *Pterostoma palpina* (Aug. 13th), *Pheosia dictæoides* (two fine specimens Aug. 13th and 15th), *Notodonta dromedarius* (a beautiful specimen Aug. 15th), *Cerura furcula* (a fine specimen Aug. 13th), *Bryophila perla* (the commonest species at light), *B. glandifera* (a nice uniformly green form Aug. 12th, apparently not common, as searching the walls produced only *B. perla*), *Acronycta psi*, *A. rumicis* (a fine specimen Aug. 11th), *Nonagria geminipuncta* (one at light in the town on Aug. 15th; this seems unusual as there is no reed-bed within half a mile of the lamp at which it was taken; it is not uncommon in the neighbourhood), *Hydræcia paludis*, *Apamea didyma*, *Xylophasia monoglypha*, *Cerigo cytherea*, *Agrotis puta*, *A. nigricans* (this is, I believe, an uncommon insect in Sussex, one was taken on Aug. 11th), *A. tritici*, *Triphæna ianthina*, *T. pronuba*, *Calymnia trapezina*, *C. diffinis* (two on Aug. 13th), *Phorodesma cytisaria* (Aug. 13th), *C. affinis*, *Hadena chenopodii*, *Crocallis elinguaria*, *Boarmia rhomboidaria*, *Acidalia rusticata* (Aug. 13th and 14th), *A. bisetata*, *A. virgularia*, *A. aversata*, *A. imitaria*, *Thamnonoma wauaria*, *Lobophora viretata* (at light and on walls, Aug. 13th), *Eupithecia oblongata*, *E. assimilata*, *E. coronata*, and *Melanippe fluctuata*; also several species of the commoner Pyralids and Crambi.

Such is the list. If it does not contain anything very remarkable, the occurrence of certain of the species in August at all is peculiar, and an interesting example of the effect which a sudden rise of temperature after a cold spell may be expected to produce. I regret very much that I did not have time to try sugaring on the coast; but from my experience and that of many others this year has not been favourable for sugar, and consequently I preferred other methods of work.

I may perhaps mention in conclusion that Rye, excellent as it is in itself, is within easy reach of other famous localities. Abbot's Wood, the Downs and the country round Ashford are all readily accessible. My only excursion, however, during the present year was to Folkestone, where I spent a glorious though somewhat torrid day upon the chalk. My success was not phenomenal. *Lycæna bellargus*, which by the end of the month makes the slopes a wonder of glaucing colour, was not yet out, but *Melanargia galatea*, *Argynnis aglaia*, *Lycæna corydon*, *Adopæa thaumas* (*linea*), and *Argiades sylvanus* were all common. Of moths the following were captured:—*Leucania conigera*, *Miana furuncula*, *P. ænea*, *Gnophos obscurata* (a nice form approaching ab. *fasciata*), *Acidalia ornata*, *Ematurga atomaria*, *Aspilates gilvaria*, *Coremia ferrugata*, and *Ortholitha bipunctaria*.—E. C. Raven; 7, Canning Street, Liverpool.

RECENT LITERATURE.

Plant Galls of Great Britain: a Native Study Handbook. By Edward T. Connold, F.Z.S., F.E.S. With 354 illustrations. Pp. i–xii, 1–292. London: Adlard & Son. 1909.

In December, 1908, we had the pleasure of calling attention to Mr. Connold's 'British Oak Galls.' What we said of that work

equally applies to the present handy and inexpensive little volume. The larger book, however, deals specially with galls of the oak, but the one under notice treats of all kinds and conditions of plant galls, the work of Aphides, Diptera, Hymenoptera, Coleoptera, Lepidoptera, Eriophyidæ, Anguilluilidæ, Fungi, &c.

The excellent illustrations, mainly from photographs, are not only of great value in the identification of galls when met with, but if any particular gall is wanted, a study of the picture of that gall will add considerably to the chance of finding it.

In the opening chapters much information about galls and their producers is condensed, but clearly presented. There are useful lists of Host-plants (English and Latin names), so that if the plant is known, the nature of the gall thereon is, in most cases, easily ascertained.

We cordially commend this book to all who desire to know something authoritative about Plant Galls.

The Scaly-Winged. By R. B. Henderson, M.A., Assistant Master at Rugby School. Pp. i–xii, 1–115, 22 illustrations in the text. London: Christophers. 1909.

In the preparation of this brief introduction to the study of moths and butterflies the author had in view the requirements of Rugbeians who wish to qualify for entering the entomological section of the school Natural History Society.

Among the subjects discussed are: Classification of Organisms; the Four Phases of Lepidoptera; Difference between Butterflies and Moths; Bionomics. The student who assimilates all that is set down under these heads will have acquired a good groundwork of entomological knowledge.

Transactions of the Carlisle Natural History Society. Vol. i. Carlisle: James Beeby & Sons. 1909.

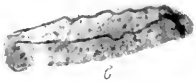
We are glad to note that this local Society, established only some fifteen years ago, and with but a slender list of members for some time subsequently, has progressed so well that it is now in a position to issue a volume of its 'Transactions.' The publication as a whole is of considerable merit, and contains some interesting papers. Among those more directly of interest to the entomologist are the following:—"The Fauna of Cumberland, in relation to its Physical Geography," by Frank H. Day, F.E.S. (pp.63–74); "The Butterflies of Cumberland," by George B. Routledge, F.E.S. (pp. 98–113); "The Coleoptera of Cumberland," Part I, by Frank H. Day, F.E.S. (pp. 122–150).

Illustrated Guide to the Trees and Flowers of England and Wales. By H. G. Jameson, M.A. Pp. i–xi, 1–136. London: Simpkin, Marshall & Co., Limited. 1909.

The object of this book is to assist the nature-lover to name trees and flowers by means of a "key," with the addition of reduced drawings of leaves and blossoms in the margin of the text.

a

6



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W. J. Lucas del. aut photo. West, Newman proc.

ANTHOMYIA SPRETA ON EPICHLOË TYPHINA.

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SOME POINTS IN THE LIFE-HISTORY OF *ANTHOMYIA SPRETA*, MEIG.

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

(PLATE VI.)

IN the early summer there may not infrequently be seen a curious white fungus which engirdles the culm of certain grasses for nearly an inch of its length (pl. vi, fig. 1). This is parasitic on the grass, causing injury to it by checking its growth above the part affected by the fungus. A glance at the figure shews that the parasite and its host, the grass, bear no little similarity to a miniature bullrush, and this resemblance, we may assume, suggested the name *Epichloë typhina*, Tul., for the fungus.

To get rid of this fungus is not an easy matter for the agriculturist, but fortunately he has somewhat of an ally in a small dipteron, *Anthomyia spreta*, Meig.* This fly lays its eggs on the surface of the fungus. They are somewhat cylindrical pale bodies, one of which may be seen unhatched on fig. 2*a* magnified about six times. When it hatches, the egg splits along the side attached to the fungus, and the egg-shell does not fall away, but remains where it was first laid. An egg-shell may be seen at fig. 2*b* a little above and to the left of the unhatched egg. When they enter the world the little larvæ find beneath them an immediate supply of suitable food, on which they literally make incursions, traces of which may be seen below the egg-shell.

As the larva (fig. 6*a*, *b*) grows, the egg-shell does not properly cover it, and it builds a waxy tunnel with the egg-shell on its surface, and within this it shelters when not making incursions into its food. In consequence of this the egg-shell, which was cylindrical at first, now has its two broken edges separated from one another. The upper surface falls in as it becomes approximately flat, and then a ridge in the shape of a long ellipse is formed surrounding the depression. This is very well shewn in fig. 4. The traces of the incursions made by the larva to obtain food are also very clear in this figure, and in the preceding one

* The first and fairly full account of the life-history of this fly is given by M. le Docteur Giraud in the 'Annales de la Soc. Ent. de France,' 1872, p. 503.

also (fig. 3), where the tunnel is inhabited by a larva of smaller size. In fig. 5 is depicted the tunnel of a large (if not full-grown) larva, the scale of magnification being the same as that of figs. 3 and 4.

Partly grown larvæ are shewn in fig. 6, *a* and *b*. Like so many dipterous larvæ they are simple maggots, means of extended locomotion and so forth being unnecessary, since they are surrounded by a good supply of suitable food. When full-fed the larvæ fall to the ground, and form around themselves a reddish-brown puparium between 3 and 4 mm. long (fig. 7), which is again very characteristic of certain groups of the Diptera. From this puparium emerges in the following spring (though there is probably a partial autumn brood sometimes) a little blackish fly (fig. 8), in general appearance not unlike a small house-fly, though smaller, for it is but some 9 mm. in expanse of wing.

Explanation of Plate.

Fig. 1. The fungus, *Epichloë typhina*, *in situ*, on culms of grass. Fig. 2, *a*. Unhatched egg of *Anthomyia spreta*; *b*. Egg-shell of *A. spreta* (× 6). Fig. 3. Egg-shell, tunnel, and tracks of larva of *A. spreta* (× 4½). Fig. 4. Egg-shell at a later stage (×4½). Fig. 5. Egg-shell and tunnel of a large larva (× 4½). Fig. 6, *b*. Larva of *A. spreta*; *a*. larger larva of *A. spreta*, photographed from microscope slides prepared by Dr. T. A. Chapman (× 6). Fig. 7. Puparium of *A. spreta*, drawn from living or recently dead specimens (× 9). Fig. 8. Imago of *A. spreta*, drawn from dead specimens (× 4½).

NOTES ON DRAGONFLY PARASITES (LARVAL WATER-MITES).

By F. W. & H. Campion.

The presence of parasitic Arachnida has been detected upon insects representing each of the seven great orders. As an example of Hymenoptera attacked in this way, we may mention a European sawfly (*Tenthredo maura*) in the National Collection, to which Mr. W. F. Kirby has kindly drawn our attention. The Acari found parasitic upon ants and bees are so numerous, both in species and in number of individuals, that quite a large literature exists upon the subject. More than one collector has informed us that mite-attacked Lepidoptera are not infrequently met with. Among Diptera, Mr. Charles D. Soar * has figured a specimen of *Cænia obscura*, Mg., with a larval Hydrachnid wedged between the thorax and abdomen. Among Coleoptera, the same author mentions several species of *Dytiscus* which serve as hosts, and figures an example of *D. marginalis* with numerous mites on its ventral surface, and with some even on one of its

* See his paper "Notes and Observations on the Life-history of Fresh-water Mites," in Journal Quekett Micro. Club, 1906, pp. 359-370, and plates 26-30.

legs. All known species of Acari belonging to the genus *Canestrinia*, Berlese, are found upon insects, and mostly upon Coleoptera; numerous Gamasidæ, when in the immature stages, are found wholly or chiefly upon Coleoptera. Prof. C. V. Riley has published an interesting account ('American Naturalist,' xii. p. 139, 1878) of his researches into the life-history of the North American locust-mite, to which he gives the name *Trombidium locustarum*. Speaking of the newly-hatched larvæ, he says: "These little six-legged specks crawl upon the locusts and fasten to them, mostly at the base of the wings or along their principal veins." He adds: "That they are often so numerous as to weaken and kill their victim, reports clearly prove." Most aquatic Rhynchota are subject to the attacks of water-mites, and Prof. Riley says that over five hundred have sometimes been counted on a single specimen of *Zaitha* (*Belostoma*) *fluminea*, Say, a large American species. Coming to the Neuroptera, we may cite a female scorpionfly (*Panorpa germanica*) taken by ourselves in Epping Forest, and having a mite located on the under side of the right hind wing.

It must, however, always be remembered that the word "parasitic" is used in different senses by various writers, and that the meaning of the word as used by most biologists is wider in its signification than that attached to it by the popular idea. It is necessary to remember this when dealing with the Acari, as so many of that group of creatures, particularly in the immature stages, seek only conveyance from the host on which they are found, and not nourishment; the parasitism being temporary and apparently for the purpose of the distribution of the species of mites: this is chiefly confined to terrestrial Acari, as far as is at present known. There are numerous other variations in the nature of the relations of the so-called Acarine parasite to the host upon which it is found.

Although water-mites attach themselves so freely to many kinds of aquatic insects, we have not yet met with any instance of a nymphal dragonfly being attacked by them. We are acquainted with cases in which Acari have attacked imaginal dragonflies belonging to the sub-families Libellulinæ, Gomphinæ, and Agrioninæ. Among the Libellulinæ, *Sympetrum meridionale* is a notorious instance: indeed, McLachlan wrote of it that "its liability to have the well-known red Acari attached to the wings (sometimes in enormous numbers) is so marked as to be almost a specific character of the insect itself, few specimens being entirely free from them" (Ent. Mo. Mag. xx. p. 253, 1884). Thirteen examples of this species taken casually in France were exhibited by Mr. McLachlan at a meeting of the Entomological Society of London. Only one of them had escaped attack, but the remaining twelve carried between them no fewer than four hundred and eighty-one parasites. Single specimens had as many as

seventy-three, ninety-six, or even one hundred and eleven of them. "They were firmly fixed on the nervures towards, and at, the base of the wing, and almost (but not quite) invariably on the under side, and whatever might be the number on any particular dragonfly it was always divided nearly symmetrically on the two sides of the insect, those much infested having a very pretty appearance, from the wings appearing as if spotted with blood-red" (Ent. Mo. Mag. xiii. p. 95, 1876). Two excellent plates accompany a paper by M. Krendovsky on the economy of the larvæ of Hydrachnidæ published in a Russian periodical (Trud. Charkov Univ., 1878, Tom. xii, pp. 221–286). Figure 7 on Plate 1 shows a specimen of *S. meridionale* having numerous mites, coloured red, distributed in a remarkably symmetrical manner along the principal nervures of the wings. Another figure (8) on the same plate represents, again in colour, three of the mites on a large scale. These mites are described as the six-legged larvæ of *Arrhenurus papillator* (Müll.), but, as will appear later, this determination is by no means certain.

Krendovsky also states that Hydrachnid larvæ occur on the sternum of *S. flaveolum*. This is the only case which has come to our knowledge in which larvæ have been found on the body of an Anisopterid dragonfly. Some of the specimens of *S. fonscolombii* taken by Mr. C. A. Briggs in Surrey in 1892 were much affected by a dark carmine-coloured *Acarus*; on one of the dragonflies he counted as many as eighty-five parasites. Mr. Briggs asks, "Do these Acari extract any colouring matter from their host? They exactly match the colouring of the nervures, and one that I squeezed gave out a similar coloured fluid" (Ent. Mo. Mag., ss. iii. p. 194, 1892). *S. striolatum* has also been mentioned in this connection, but apparently in error for *S. meridionale*.

An example among the Gomphinæ is afforded by a female of *Platygomphus dolabratus* from India in the British Museum, which has a red parasite on the left hind wing.

But it is among the Agrioninæ that Acari are met with most abundantly, and our own collection furnishes examples of six species which are infested to a greater or smaller extent. Those species are *Erythromma naias*, *Pyrrhosoma nymphula*, *Ischnura elegans*, *Agrion pulchellum*, *A. puella*, and *Enallagma cyathigerum*. We have also noticed an immature female of *P. tenellum* in the Stephens cabinet carrying a single mite on the sternum. Furthermore, Krendovsky includes *Lestes* in the category of mite-attacked dragonflies. In all the cases which have come under our personal observation, the parasites are attached to the under side of the thorax or abdomen, or both (but never to the wings), sometimes in twos and threes, sometimes covering the entire surface affected. In life they appear to the unaided eye as globose bodies less than a millimetre in diameter when fully

grown, colourless at first, but usually reddish or reddish-brown in later life. Unless they are placed immediately in a preservative fluid, however, they quickly lose both their colour and rotundity. We have always noticed that mites occur most plentifully when their Zygopterid hosts are but newly on the wing, and it would seem that dragonflies rid themselves of their parasites to a great extent as the season advances. We have, however, a mite-attacked male of *E. cyathigerum* taken at the Black Pond, Surrey, as late as September 3rd. It would also seem that some larvæ leave the egg much sooner than do others, for we have met with teneral specimens of *P. nymphula* early in May and teneral examples of *E. cyathigerum* towards the end of July carrying larvæ in the same colourless and ungrown condition. Although, as we have seen, locusts are weakened and even killed by the attacks of parasites, there is no evidence before us of injury done to Odonata in this way.

The occasional presence of mites upon Odonata was known so long ago as 1778, when De Geer figured and described red parasites from the thorax of a small dragonfly under the name *Acarus libellulæ*, and identified them with the *A. gymnopterorum* of Linnæus. By these and other old writers they were regarded as adult forms, but it was subsequently recognised that these six-legged creatures were larval forms which in later life acquired the fourth pair of legs proper to Arachnida. As we have seen, Krendovsky called some larvæ from the wings of an Anisopterid dragonfly *Arrhenurus papillator*, and, following him, Mr. Soar considered parasites from the bodies of such dragonflies as *Agrion pulchellum* and *A. puella* to be no other than *Arrhenurus globator*. We have made several enquiries with a view to clearing up the doubts which still exist respecting the affinities of dragonfly parasites with other larval Hydrachnidæ, but we have failed to elicit any definite information, owing to these parasitic stages being so little understood. Three species of Zygopterides with mites attached to their bodies were submitted for examination to the eminent Hydrachnologist, Herr F. Koenike, of Bremen. He has kindly informed us that the parasites belong to different species of Hydrachnidæ, but to the same genus. At present he is unable to say with certainty into which genus the larvæ fall, but in any case he does not agree with those authors who have referred them to *Arrhenurus*. Attempts made by Herr Koenike to rear dragonfly parasites have not been successful, but he has bred the real larva of *A. globator*, and he is satisfied that the parasites in question have nothing whatever to do with *Arrhenurus* larvæ.

It was suggested by McLachlan that the parasites may attain their position on the body or wings of a dragonfly by climbing up the legs of their host while it is at rest. This suggestion, in itself a likely one, is rendered the more probable by the fact that in our experience of Zygopterides the mites

appear on the sternum of their host earlier than on the abdomen. Moreover, all the Odonata carrying Acari on their wings which have come under our notice belong to the Anisopterid division, whereas all the Zygopterid dragonflies which we have known to be infested have borne their parasites upon the inferior surface of the thorax or abdomen, or both, but never on the wings. Also, as we have seen in the case of the Anisopterid *Sympetrum meridionale,* mites attach themselves to the lower surface of the wings more readily than to the upper surface. These circumstances will be better understood when it is remembered that Anisopterid dragonflies rest with their wings spread out horizontally, while Zygopterid dragonflies in a state of repose generally hold their wings erect. And the frequency with which the smaller dragonflies are attacked is no doubt accounted for by the fact that they habitually cling to rushes and other aquatic vegetation when not in flight, while the larger species usually take shelter among the branches of trees, high above the level of the water.

Our cordial thanks are due to Mr. Albert D. Michael both for directing our correspondence with specialists and for perusing these notes in draft; to Mr. Francis P. Marchant for helping with the Russian literature consulted; and to Mr. W. F. Kirby for kind and ready assistance rendered on this and many other occasions.

Note.—Since the foregoing was written, I have had the advantage of discussing this matter with Dr. F. Ris during an interview with him at Brussels. Although *Sympetrum meridionale* and *S. fonscolombii* are the only Odonata he has met with carrying Acari on the wings, he has found several imaginal Anisopterids—such as *Cordulia ænea*, *Libellula quadrimaculata*, and species of *Leucorrhinia*—having Acari on the thorax and abdomen. Furthermore, he told me that a large proportion of the nymphs collected by him in Switzerland have been infested with Acarine parasites, and, in the cases of *Sympetrum sanguineum* and *Enallagma cyathigerum*, he has actually witnessed the mites passing from the nymphal skin on to the skin of the imago while the emergence of the dragonfly has been taking place.—H. C.

33, Maude Terrace, Walthamstow: Sept. 6th, 1909.

SIX WEEKS AMONGST HUNGARIAN BUTTERFLIES.*

By W. G. Sheldon, F.E.S.

With so much of Eastern Europe at present closed to the lepidopterist who values his safe return home, Hungary offers one of the chief centres for observing certain butterflies, the area of distribution of which does not extend so far west as the Alps; and for this reason most of us get there sooner or later.

* Among other comparatively recent papers on Hungarian butterflies may be mentioned two published in this Journal:—"A Fortnight's Collecting at Budapest," by W. E. Nicholson, F.E.S. (vol. xxv. pp. 191–193, 210–212); "Two Seasons among the Butterflies of Hungary and Austria," by Margaret E. Fountaine, F.E.S. (vol. xxxi. pp. 281–89).

With the companion of several previous expeditions, Mr. E. F. S. Tylecote, I reached Budapest on May 29th last. The next day the net was unfurled on the Schwabenberg, or Sváb-hegy as it is called in Magyar, a hill several miles west of Budapest, best reached by taking the electric tram from the west end of the Franz Josef Bridge over the Danube as far as the Varos Major terminus of the rack and pinion railway, by which one then travels to the station of Sváb-hegy itself.

Sváb-hegy is a large rounded hill, rising to perhaps six or eight hundred feet above the surrounding country, fast becoming a suburb of Budapest, and already covered in parts with villas. But it has still considerable stretches of uncultivated land, consisting of grassy slopes, rough ground thickly covered with a growth of herbs and flowers, and stretches of wood, chiefly oak, with open glades in places; the subsoil is calcareous.

On leaving the station one follows the line which terminates at the top of the hill further on by taking the road on the left side, running parallel to it for a few hundred yards, until a flight of wooden steps is seen leading to the left up the hill-side, at the top of which is a patch of oak scrub of several acres in extent, with some nice glades running through and amongst it. Here were plenty of butterflies, amongst them *Cœnonympha iphis* and *C. arcania* being abundant; the latter a fine, large, bright form; the former with the ocelli much larger than in French or Swiss examples; *Melitæa phœbe* was frequent, and the slow flight of *Leucophasia sinapis* was unmistakable. A large Hesperiid flying plentifully rapidly to and fro was netted, and proved to be *H. carthami*; various species of the Lycænidæ were seen, including *Lycæna hylas*, *L bellargus*, *L. icarus*, and *Rusticus argus* (*ægon*), which was abundant.

Proceeding further I came to a large open space thickly covered with flowering plants, almost to the exclusion of grass, and including the fine purple *Salvia pratensis* (a rare British plant), various species of *vicia*, and numerous composites. The wealth of insect life here was quite unusual, and, in addition to butterflies, one came across many moths found in Britain, including *Lithostege griseata*, *Agrophila sulphuralis*, *Scoria lineata*, *Heliothis dipsacea*, and *Acontia luctuosa*; an assemblage which it would be difficult to meet with in our islands in one field. With them occurred in abundance the butterfly which was the chief object of my visit to Sváb-hegy—the lively little black and white skipper *Pyrgus orbifer*, which reaches at Budapest almost its western limit. My predecessors, who had visited Hungary in early June, had invariably found this species *passé*. On this day it was considerably past its best, and I had to use much selection to get a good series. I should give the middle of May as the best time; its habits of flight are similar to *Hesperia malvæ*, which was equally common with it; on the wing

one has difficulty in separating the two species, except that *P. orbifer* is somewhat browner in colour; a few examples also of *Hesperia alveus* were flitting about with the other two species.

The hill culminates in a bare ridge, commanding a fine view of the plain and the river Danube; here freshly emerged *Parnassius mnemosyne* were not infrequent, these being distinctly larger than my Swiss examples, and having the black blotches in both sexes smaller, darker, and better defined. An odd Chysophanid turned out to be a female of *C. thersamon*, a new species to me, and also a good example of *Melitæa trivia* was netted, but not recognised until I got home.

We paid further visits to Sváb-hegy on the 3rd, 5th and 7th of June, and were rewarded each day by interesting species, including the fine form of *Polyommatus orion* var. *ornata*, not uncommon in the oak glades amongst the sedum plants; *Melitæa trivia* was not infrequent, but very local, some of the specimens being already past their best. But by hard work I managed to get together eighteen or twenty good examples. *M. trivia* is easily recognised in flight from its *confrères*, for it is the swiftest species of the genus I have seen; and this habit, with its small size, makes it difficult sometimes to follow with the eye. From its nearest relation *M. didyma*, the lesser size and darker colour serve to distinguish *M. trivia* at once, whilst from the only species of its size flying at the same date, *M. aurelia*, it is at once separated by the more rapid flight. In one field *M. aurelia* was abundant. I used to think that specimens of this species, or those that I could not separate from it, taken at high altitudes in Switzerland, flying with *M. parthenie* var. *varia*, were only forms of the latter, and I do not know that this opinion has been much changed since; but certainly *M. aurelia* seems distinct enough in Hungary from any other species of the genus, the specimens being strictly typical and showing no approach to *M. parthenie* or to any other species; and being at once distinguished from *M. athalia*, which was flying at Budapest in early June, by size and general appearance. *M. didyma* was just emerging; the examples were brightly coloured and of good size. I was much surprised to net, in a glade at the top of the steps before-mentioned, a fine example of *Neptis lucilla*, a species I had not expected to come across at Budapest.

I had been provided by my friend Mr. A. H. Jones, who most kindly placed at my disposal the results of his successful visit to Hungary two years previously, a letter of introduction to Herr Aigner of the Budapest National Museum. Accordingly we called there on May 31st, but learnt that Herr Aigner had been unable to follow his duties at the Museum for a considerable time; and I am sure all who are interested in entomology, especially those who have visited Hungary, will greatly regret that his long illness terminated fatally in June.

On making known that we wished to see the Museum collection of Hungarian butterflies, we were most kindly welcomed by Dr. Soos, and introduced to Professor Schmidt, who was in charge of the insect department. To this gentleman we are deeply indebted for his great kindness to us during our stay at Budapest, for during that time he placed himself and his knowledge entirely at our disposal, acquainting us with the best localities for the species we wished to get, and accompanying us there, interpreting, and assisting us in every possible manner. This assistance was exceptionally valuable, for Budapest is a most difficult district to work, primarily because all the best localities are at some distance, and also because there does not appear to exist a suitable map of the environs.

On the 1st of June we accompanied Professor Schmidt to Kamaraerdo, our chief object being to obtain series of the two local species of *Chrysophanus* found in the Danube marshes, *C. dispar* var. *rutilus*, and *C. thersamon*. To my note on the former species (see 'Entomologist,' *antea*, pp. 219–220) I will only add that on this day I captured twelve males and three females, most of them in perfect condition. Of *C. thersamon* I obtained eleven males and one female, all in good order. *C. thersamon*, unlike *C.* var. *rutilus*, frequents flowers, chiefly those of *Salvia pratensis*, settling on them and exposing its brilliant upper side to catch the warmth of the sun. Great quantities of *Aporia cratægi* were flying everywhere, and some of the assemblies congregated on the damp patches on the road were enormous, and must have consisted of several hundred individuals.

The country collected over was a valley extending from Kamaraerdo station to the village of Promontor, some three miles distant, and from which electric trams conveyed us to the foot of the Franz Josef Bridge at Budapest; as a matter of fact, after our first journey we travelled by tram, which we found much quicker and more convenient than by taking the train.

On a subsequent visit to this locality (June 4th), Professor Schmidt being unable to accompany us, Dr. Soos most kindly acted as our chaperon. This was very desirable and probably saved us some unpleasantness, for the butterflies were on cultivated ground, the owners of which I understand have been known to object strongly to strangers wandering amongst their crops, but the Museum authorities can go anywhere. On this occasion *Chrysophanus* var. *rutilus* was abundant, and my bag of twenty-three examples included half a dozen females. I also captured a fair example of *Thais polyxena*, and saw a few small larvæ of that species on the food-plant, *Aristolochia clematitis*. *Argynnis niobe* var. *eris* was just coming out. *Chrysophanus thersamon* was by this date practically over, and all the examples observed were hopeless as cabinet specimens.

On the 6th of June we again visited the marsh; but the day

was a bad one with little sun, and beyond a few more *Chrysophanus* var. *rutilus* we did not observe anything worthy of note.

On the 8th of June we took the early morning train to Szada, a residence of Baron Vécsez, who had invited us to spend the day there. We were met at the station by a carriage, in which we drove several miles to the house, where we were received with characteristic Hungarian kindness and hospitality, and enjoyed a most delightful visit. In the morning we were conducted by Baron Vécsez through a tract of country consisting chiefly of vineyards and orchards, in which many of the bare-footed and picturesquely clad peasantry of both sexes were working, to some fine woods crowning rising ground; here we were pleased to come across *Chrysophanus alciphron* in large numbers and in splendid condition. The day unfortunately was cloudy with rain, and we had only a few minutes sun, but during that time managed to secure about thirty specimens and also some *Melitæa trivia* and *Argynnis adippe* var. *cleodoxa*. I found at rest a female of *Rusticus argyronomon* (*argus*), which is certainly the finest form I have ever seen of that species, and has a very pronounced and brilliant orange band on the under side of the hind wings.

In returning we were shown some banks covered with *Aristolochia clematitis*, on which the larvæ of *Thais polyxena* were feeding in enormous numbers; it would not have been difficult, I believe, to collect 1000 larvæ or even more, but I contented myself with about five dozen full-grown examples, which have since produced over fifty fine pupæ. In the afternoon we looked through Baron Vécsez's collection of Hungarian lepidoptera, which contained some interesting specimens.

Our last day in the neighbourhood of Budapest (June 12th) was devoted to the famous locality of Pészer. Before visiting Hungary I had a very indefinite idea where this place was situated; for beyond stating that you took the train from Budapest to Dabas, a two hours' journey, all the accounts I could find of those that had visited Pészer were silent, and as Baedeker does not mention Dabas and Bradshaw knows it not, I had not the remotest idea of the direction in which it lay or how to get there. It may therefore not be out of place to state that the station in the railway guide is named Alsó Dabas, which means Lower Dabas, and is situated about thirty miles south-east of Budapest, on the railway to Lajosmizse.

Leaving Budapest by the early morning train we arrived on the ground about 10.30 a.m. I can quite understand the enthusiasm which this wood produces on all who visit it. Peszer is indeed a wonderful locality for Diurni, which were far more plentiful than I saw elsewhere in Hungary; in fact, I have not seen anywhere in Europe a locality in which butterflies were in greater abundance. Various causes have probably

produced this luxuriance of individuals. Pészer is one of the few spots which has probably always been uncultivated, a remnant of the old Pannonian Forest which once covered the whole of the country; the soil is of a warm sandy nature, and the vegetation luxuriant and varied.

Immediately on unfolding our nets we were confronted with the difficulty, amidst such riches, of not knowing what to choose. Swarms of *Brenthis hecate*, in perfect condition, hovered over the grass, and *B. hecate* is not an easy species to obtain. A series of it was therefore one of our first objects; they were very different to my Spanish examples, with much smaller blotches on the upper side, and with the chestnut blotches and the markings generally on the under side of the hind wings much more brilliant. The fine *Chrysophanus alciphron* was almost equally numerous, flitting about in the clearings and settling on the flowers. A series of two dozen was soon secured, including nine or ten females, and then one found that numerous Theclas were flying round and settling on the oak bushes, presently identified as *Thecla acaciæ*, the first time I had seen it alive, and *T. ilicis*; both of them in the finest condition. *Melitæa trivia* was abundant, but going over, and good specimens required considerable selection. Bright yellow Coliads flew wildly here and there; several I caught were certainly only *Colias edusa*, but one I missed looked very like *C. myrmidone*, and was the only example of the species I came across in Hungary, if it was it. To the Skippers flitting briskly to and fro I had not much time to devote; but *Hesperia carthami* was abundant, also *Pamphila sylvanus*, and either *P. linea* or *P. lineola*, or both; *Carcharodus lavateræ* was also not infrequent.

Naturally we made a careful search for *Melanargia* var. *suwarovius*, but with not much anticipation of success, for this species has of late years become very rare at Pészer—the cumulative bag for the last three years consisting, so far as I could learn, of only seven examples, and our search was unsuccessful. I may here mention that Professor Schmidt informed me on my return to Budapest in July that *M.* var. *suwarovius* has not been seen this year.

Intending visitors to Pészer should note that it is Crown property, and that a permit, difficult to obtain, has this year for the first time been required; and they should before going enquire at the Budapest Museum, the authorities of which can, and no doubt would, do their best to assist.

On my return to Budapest on July 2nd I searched carefully the capsules of *Colutea arborescens* at Farkas Volgy for larvæ of *Lycæna iolas*, which I was informed should there be plentiful, but without success; probably the bad season was responsible for the failure.

(To be continued.)

CONTRIBUTIONS TO A KNOWLEDGE OF ETHIOPIAN ECONOMIC ENTOMOLOGY.*

By W. L. Distant.

The genus *Sahlbergella*, Hagl. (Fam. Capsidæ) is now known by two species, both of which are injurious to the Cocoa-tree (*Theobroma*, sp.)

Genus Sahlbergella.

Sahlbergella, Hagl. Öfv. Vet.-Ak. Förh. 1895, p. 469; Reut. Zool. Anz. xxxi. p. 102 (1907).

Deimatostages, Kuhlg. Zool. Anz. xxx. p. 29 (1906).

Gen. ? nov. Grah. Journ. Econ. Biol. iii. p. 113 (1898).

Type *S. singularis*, Hagl.

Sahlbergella singularis.

Sahlbergella singularis, Hagl. Öfv. Vet.-Ak. Förh. 1895, p. 469; Kirk, Wien. Ent. Zeit. xxii. p. 13, fig. 1 (1903); Reut. Zool. Anz. xxxi. 102 (1907).

Deimatostages contumax, Kuhlg. Zool. Anz. xxx. p. 31, figs. 1–4 (1906).

Gen. ? nov. *longicornis*, Grah. Journ. Econ. Biol. iii. p. 113, pl. viii. figs. 1–2 (1908).

In S. Ashanti, according to Dr. Graham (*supra*), "very large numbers of these insects were found on the diseased trees, and not on the healthy ones. They appear to damage the trees by perforating the bark and so producing 'gumming.'"

Sahlbergella theobroma, sp. n.

Black; posterior lateral margins to pronotum, base and costal margin to corium, irregular segmental spots to connexivum, lateral areas of meso- and metasterna and disk of abdomen beneath fuscous or brownish-ochraceous; antennæ incrassate, basal joint considerably thickened and shorter than fourth joint, second gradually thickened from base, globosely incrassate at apex and about as long as head and pronotum together, second and third joints very stout and pyriform, third longer than fourth; pronotum slightly but distinctly gibbous behind the anterior pronotal angles, rugose, with scattered tubercles; scutellum prominently raised, rugose and tuberculate, the apex robustly posteriorly produced and slightly curved downward; membrane opaque, considerably passing the abdominal apex; tibiæ robust and strongly shortly pilose, the tarsi stramineous. Long incl. tegm. 8½ to 10 millim.

Hab. Gold Coast: Fancheneko (Dudgeon—type Brit. Mus.)

Allied to *S. singularis*, Hagl., but differing in the black coloration, the shorter second joint of the antennæ, rugose pronotum and scutellum, and the more apically recurved scutellum.

* A previous communication as regards cotton pests will be found in 'Entomologist,' 1906, p. 269.

Mr. Dudgeon calls the species the "Cocoa-bark Sapper," and it is thus referred to in his 'Fourth Report on Agricultural and Forest Products of the Gold Coast to Secretary of State Colonies, 1909.'

A NEW GENUS AND SPECIES OF ORNEODIDÆ (Lep.).

By T. Bainbrigge Fletcher, R.N., F.E.S.

Microschismus, nov. gen.

(μικρός, short; σχισμός, a cleft.)

Maxillary palpi absent. Labial palpi very long, at least twice length of head, densely scaled. Fore wing cleft into six segments from beyond two-fifths; hind wing cleft into six segments within half.

Type.—*M. fortis*, Wlsm. (T.E.S. 1881, 284–5, t. xiii. f. 49).

The above forms the fourth described genus of the Orneodidæ, which may now be tabulated generically as follows:—

1 { Hind wing cleft into seven segments ..... *Triscædecia.*
  { Hind wing cleft into six segments ..... 2.

2 { Fore wing cleft from at least one-third ..... *Orneodes.*
  { Fore wing cleft from about half only ..... 3.

3 { Labial palpi at least twice length of head ..... *Microschismus.*
  { Labial palpi not exceeding length of head ..... *Pœlia.*

Besides the above-quoted type the genus *Microschismus* contains the following new species:—

Microschismus antennatus, n. sp.

♂. Exp. 16 mm. Labial palpi very long (about thrice length of head), down-curved, densely scaled so that proportions of joints are not visible but third joint is apparently very short, fuscous. Maxillary palpi absent. Haustellum feebly developed. Head roughly scaled, fuscous. Antennæ fuscous, each joint emitting a pair of bristles slightly longer than length of joint on which they arise. Thorax fuscous. Abdomen fuscous, suffused with blackish; anal tuft pale fuscous. Legs fuscous grey; posterior tibiæ with two pairs of moderate, unequal spurs. Fore wing cleft into six segments; first cleft from about two-thirds, second from slightly beyond half, third from about two-thirds, fifth from about half, fourth from halfway between third and fifth; segments linear: light greyish-brown with a very slight yellow tinge minutely irrorated with dark-fuscous dots, especially evident on basal third: bases of third, fourth, and fifth clefts outlined in dark-fuscous, forming a conspicuous line running obliquely inwards across the wing; first segment crossed by two indistinct dark-fuscous bands at about one-third and two-thirds of its length; remaining segments cut by a moderate dark-fuscous band at about three-fifths of their lengths, preceded and followed by slightly paler spaces; apices of all segments with a blackish dot. Cilia

light-fuscous mixed with darker: on costa suffused with dark-fuscous to about half, with dark-fuscous dots just before and beyond two-thirds; on all segments darker opposite dark bands. Hind wing cleft into six segments: first cleft from within half, second from about a quarter, third from beneath base of first cleft, fourth from about one-third, fifth from about one-sixth; segments linear: light fuscous irrorated with darker. Cilia light-fuscous, very long on dorsal margin.

Type ♂ in Oxford University Museum. It is labelled "Orange River Colony, near Bothaville, Valsch River, five miles from Vaal, Blockhouse No. 74, captured April to mid-June, 1902, and presented 1902 by E. N. Bennett." It also bears a manuscript label, "May 1st, Blockhouse." I am indebted to Professor E. B. Poulton for the opportunity of examining this specimen.

M. antennatus differs from *M. fortis* in its smaller size and more dingy coloration, but is easily separated in the male sex by the antennæ, which are only very shortly ciliated in the type (male) of *fortis* which I have been able to examine through the kind courtesy of Lord Walsingham.

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

By Claude Morley, F.Z.S., F.E.S.

The extremely injurious nature of the Homoptera included in this family is perhaps better appreciated in warmer climates than in Britain, where the amount of damage annually done to our fruit-trees, &c., by these insects is by no means at present fully recognized. When this is the case it will be more clearly seen to what a very great extent the Hymenopterous parasites which destroy them are our friends than we are at present inclined to allow. Many of our leading entomologists, I have no hesitation in saying, are entirely ignorant that Coccids are attacked by the Parasitica at all; and since so little is published upon the subject in my friend Mr. Newstead's admirable 'Monograph of the Coccidæ of the British Isles' (Ray Soc. 1900 et 1902), no apology is, I think, needed for bringing forward in as succinct a form as possible what is known of this fascinating subject. I am greatly indebted to Mr. Newstead for assistance in the Hemipterous synonymy, and to Ashmead's paper "On the Genera of the Chalcid Flies belonging to the Subfamily Encyrtinæ" (Proc. U. S. Nat. Museum, 1900, pp. 323–412) for the elucidation of at least one of the main groups of these beneficial insects.

Extra-British hosts are denoted by an asterisk.

1. Aspidiotus.

From unidentified members of this genus Howard ('Revision of the Aphelinæ of North America,' 1895, p. 21) bred *Perissopterus pulchellus*, and (*lib. cit.* p. 42) *Ablerus clisiocampæ*, Ashm., which latter had been originally raised from a Lepidopteron. Dalla Torre says that *Aphelinus annulicornis*, Ratz., has also been bred from this genus, though Ratzeburg (Ichn. d. Forst. iii. 195) simply gives it as preying upon some "*Coccus*."

2. *Aspidiotus perniciosus*, Comst.*

Howard (*loc. cit.* 27) tells us that *Aphelinus fuscipennis* preys on this species, and Ashmead also represents *Rhopoideus citrinus*, How., as destroying it in California.

3. *Aspidiotus ancylus*, Putn.*

Both *Prospalta aurantii* and *Physcus variicornis* are named by Howard (*l. c.* 41 et 43) from specimens bred from this species.

4. *Aspidiotus abietis*, Schr.*

Many males and one female of *Coccobius circumscriptus*, Ratzeburg, were bred by him (Ichn. d. Forst. iii. 195) from *Coccus pini*, together with his *C. luteus* and single male *C. inconspicuus* (*l. c.* 196 et 210). *Aspidiotus pini*, Comst., is given as the host of *Prospalta aurantii*, How. (Revis. 41), and by Gaulle (Cat. Hym. France, 106) of *Aphelinus agriope*, Walk.

5. *Aspidiotus ostreæformis*, Curt.

The synonymous *A. tiliæ*, Bché., is said by Ratzeburg (*l. c.* ii. 148, iii. 189 et 192) to have produced *Encyrtus dendripennis* and *E. hirsutus*, very possibly also *E. longicornis*; the first is now synonymised with *Habrolepis zetterstedtii*, Westw., and the last with *Ericydnus longicornis*, Dalm. Gaulle (Cat. 106) adds *Azotus marchali*, How., and *Archenomus bicolor*, How., to its parasites, and Ashmead (p. 409) says the cosmopolitan *Arrhenophagus chionaspidis*, Aur., attacks *Diaspis ostreæformis*, Sign.

6. *Aspidiotus hederæ*, Vall.

This is destroyed by *Prospalta aurantii*, Howard (Revis. 41), and, under its better-known name, *A. nerii*, Bché., Tyler Townsend bred four examples of *Signiphora aspidiotii*, Ashm. (p. 412) from it in Mexico in November, 1894; Ashmead gives (p. 411) his *S. mexicana* and (p. 409) *Arrhenophagus chionopsidis*, Aur., as attacking it, and Gaulle (Cat. 106) *Aspidiotiphagus citrinus*, Crawf.

7. *Aspidiotus uvæ*, Comst.*

Howard describes ('Insect Life,' 1894, p. 6) his *Prospalta murtfeldtii* from this species.

8. *Aspidiotus zonatus*, Frauenf.

Under the name *Maskellia zonata*, Green, Ashmead records this species as the host of *Anagyrus greenii*, How., from Ceylon (p. 354), and *A. quercicola*, Bché. (probably the *A. quercus* of Signoret), is given by Dr. Giraud (Ann. Soc. France, 1877, p. 421 et 424) as sustaining *Habrolepis dalmani*, Westw., and—almost certainly in error—*Callimome coccorum*, Gir. (quoted by Gaulle, 100). *Cf.* also Howard, Proc. U. S. Nat. Mus. 1896, p. 639.

9. *Aspidiotus corticalis*, Riley MS.*

From a species so named by Ashmead, Howard (Descr. of N. American Chalcid. 1885, p. 13) instances *Encyrtus ensifer*, which is placed by the former (p. 383) in the genus *Coccidencyrtus*.

10. *Aspidiotus cydoniæ*, Comst.*

His Floridan *Signiphora flavopalliata* is instanced as preying upon this species by Ashmead (p. 411).

11. *Chrysomphalus aurantii*, Mask.

This *Aspidiotus* is recorded, together with its var. *citrinus*, Coquil., as having been attacked by *Aspidiotiphagus citrinus* by Howard (Revis. Aphel. N. Am. p. 31); by *Coccophagus lunulatus*, How. ('Insect Life,' 1894, p. 232); by *Aphycus immaculatus*, How. (*l. c.* p. 236) in California; and the above var. by *Signiphora occidentalis*, How. (*l. c.* p. 234) from the same locality.

12. *Chrysomphalus ficus*, Ashm.

Like the last species, this is said by Howard (*l. c.*) to be attacked by *Aspidiotiphagus citrinus*.

13. *Howardia biclavis*, Comst.

Aphelinus theæ is described by Cameron (Manchester Mem. 1891, p. 183) from the synonymous *Aspidiotus theæ*, Green. *Cf.* also Indian Museum Notes, 1894, p. 132.

14. *Odonaspis secreta*, Ckll.*

From this species, under the genus *Aspidiotus*, Ashmead in 1900 (p. 404) records *Homalopoda cristata*, but I fail to follow Dalla Torre (Cat. Hym. v. 240), since this association is not given in Ashmead's original description.

15. *Fiorinia saprosomæ*, Green.*

The cosmopolitan *Arrhenophagus chionaspidis*, Aur., has been bred by Howard from this species (Ashm. 1900, p. 409, &c.).

16. Diaspis.

In his Revis. Aphel., Howard records his *Aphelinus diaspidis*

from an uncertain species—rendered "*Diaste*" by D. T.—of this genus.

17. *Diaspis rosæ*, Bché.

This has been often parasitised: by *Aphelinus diaspidis*, How. (Revis. p. 26); by *Aspidiotiphagus citrinus*, How. (*l. c.* p. 31); by *Phænodiscus* (*Encyrtus*) *æneus*, Dalm., which was bred from it in Austria by Mayr (Verh. z.-b. Ges. 1875, p. 758); by *Aphycus brunneus*, How. (Descr. N. A. Chal. p. 17); by *Arrhenophagus chionaspidis*, Aur. (Ent. Tidsk. 1888, p. 146); and by *Coccobius diaspidis*, Ashm. (1900, p. 408), at Washington. The synonymous *Aulacaspis* (*Aspidiotus*) *rosæ* is said by Ratzeburg (Ichn. d. Forst. iii. 196) to have been bred by Bouché, and to have produced *Coccobius notatus*; Gaulle (Cat. 26) quotes Cameron (Brit. Phyt. Hym. iii. 233) in saying that the Cynipid *Allotria erythrothorax*, Htg., preys upon it. Newstead does not determine the *Encyrtus* (Mon. Brit. Cocc. i. 31) which causes the female to swell and the skin to become "highly chitinised."

18. *Diaspis carueli*, Targ.

This is one of the four hosts given by Howard (Revis. p. 25) for *Chalcis* (*Aphelinus*) *mytilaspidis*, Baron.

19. *Aulacaspis pentagona*, Targ.

Like *A. rosæ* above, this species is given by Howard (Revis. p. 31) as attacked by *Aspidiotiphagus citrinus*.

20. *Chionaspis eleagni*, Green.*

C. eleagni is a host of *Physcus variicornis*, according to Howard (Revis. p. 43).

21. *Chionaspis salicis*, Linn.

The Tridymid, *Tritypus areolatus*, is said by Ratz. (Ichn. iii. 227) to have been bred by Hr. Nordlinger from a *Coccus* on *Salix aurita*, from which the parasite emerged through a lateral hole. *Arrhenophagus chionaspidis* is said by Aurivillius (Ent. Tidsk. 1888, p. 146) to have emerged from this species (quoted by Ashm. p. 409), and Gaulle gives (Cat. 100) *Habrolepis zetterstedti*, Westw., as also attacking it. From a species of Coccid on willow, but unnamed, Ashmead says (p. 393) that *Microterys bolus*, Walk., has been bred at Hudson's Bay.

22. *Chionaspis graminis*, Green.*

From this species Howard (Proc. U. S. Nat. Mus. 1896, p. 637) records his *Encyrtus chionaspidis*, from Ceylon (placed in the genus *Adelencyrtus* by Ashm. p. 402), as well as his Proctotrypid *Anthemus chionaspidis* (*l. c.* p. 643).

(To be continued.)

NOTES AND OBSERVATIONS.

The Habitat of Argynnis Laodice.—The Hon. N. Charles Rothschild informs me that he has recently found another locality for *Argynnis laodice*, in the Réz Mountains near Cséhtelek, in the Bihar Comitat, Hungary. He found this species at a lower elevation than before, frequenting a damp situation at the edge of a wood where *Eupatorium cannabinum* (hemp agrimony) grows, the flowers of which were attractive to the butterflies, this making the third locality, but the species appears rare in the district. In the 'Societas Entomologica,' xxiv., nos. 4–5, is a very favourable review by M. von Gillmer of the life-history of *A. laodice*, which I published in the March number of the 'Entomologist.' This gentleman refers to the distribution of this species; from which we now learn that the most westerly limit for *laodice* is Massow, near Stettin, Pomerania, which is 12½° east of Greenwich. In my paper I mentioned that Cséhtelek in Hungary was probably the most westerly point where *laodice* occurred. Respecting the hatching of the egg of this butterfly Von Gillmer mentions that a few eggs out of several which had been subjected to warmth hatched in the autumn. This of course applies to most, if not all, eggs and cannot be considered as a proof that the eggs would hatch at all in the autumn under natural conditions. All the eggs I had under observation were kept in a cool place, and all hatched during the latter part of February.—F. W. Frohawk.

A Species of the Noctuidæ new to Science.—On July 24th last, Mr. Esson, of Aberdeen, sent for identification a noctuid moth that he had taken, at sugar, on a fir tree, twelve days earlier in the month. As the specimen could not be referred to any species with which I was acquainted, it was submitted to Sir George F. Hampson at the Natural History Museum. At first Sir George was inclined to consider the novelty referable to the N. American genus *Morrisonia*, Grote, but after further examination he decided that a new genus would have to be founded for its reception. This matter, as well as naming and describing the specimen, has been left in his hands. In general appearance, it may be noted, the moth suggests a pale reddish grey aberration of *Lycophotia* (*Agrotis*) *ripæ*; but it has hairy eyes, a prominent thoracic crest, and well-defined tufts on the abdomen; it cannot, therefore, be a member of the Agrotinæ. I am very pleased to add that the Hon. N. Charles Rothschild acquired this interesting specimen and has generously presented it to the National Collection.—Richard South.

Plecoptera, Neuroptera and Trichoptera from the Pyrénées Orientales.—Dr. T. A. Chapman kindly passed on to me the insects belonging to these orders which he took at Amelie-les-Bains, April 6th–21st, 1909, and at Vernet-les-Bains, April 24th to May 9th, 1909. They were:—* *Tæniopteryx seticornis*, Klap., Vernet. *Nemoura*, apparently of the group *marginata*, two females, one from Amelie, the other from Vernet. *Chrysopa aspersa*, Vernet. *Hemerobius subnebulosus*, Amelie. * *Panorpa meridionalis*, Vernet. *Hydropsyche pellucidula*, Amelie [also from Bagnial-sur-Mer]. *Philopotamus montanus*, Amelie and Vernet. * *Rhyacophila persimilis*, Amelie. * *R. tristis*,

Vernet. Those with * are not British.—W. J. Lucas; Kingston-on-Thames.

Raphidia maculicollis (Neuroptera).—In connection with my note on this snake-fly (*antea*, p. 129), I may note that I have received a pupa from Dr. David Sharp, which he took at Braemore in Scotland in June of the present year. This one is a female, and an interesting point about it is that its long ovipositor is folded back and lies closely pressed to the dorsal surface of the abdomen.—W. J. Lucas; Kingston-on-Thames.

Longevity of Epinephele ianira.—I believe it is generally considered that the Satyridæ are usually short-lived butterflies, therefore it may be worth recording that a freshly emerged female *E. ianira* I captured *in coitu* on July 2nd last lived in captivity until Aug. 28th, making fifty-eight days.—F. W. Frohawk.

The Influence of Temperature on the Hatching of Lepidopterous Eggs.—As an example of the influence temperature has on the development and hatching of eggs of Lepidoptera, the following is a good instance. On May 30th last a *Pieris brassicæ* deposited a batch of forty-one eggs during warm weather, but on June 2nd the temperature suddenly fell many degrees, and cold, wet weather set in and continued so for the next fortnight; consequently, the eggs did not hatch until June 16th, remaining in the egg state seventeen days. At mid-day on August 10th, during fine and very warm weather, I watched three *P. brassicæ* depositing; in all, five batches of eggs were laid. All these hatched on August 15th quite early in the morning, the egg state lasting only four and a half days, due to the weather remaining exceptionally warm throughout, thus making a difference of twelve and a half days in the time of hatching.—F. W. Frohawk.

Gynandrous Abraxas grossulariata ab. Varleyata.—Of the only two specimens of wild *Abraxas varleyata* I bred this year, the produce of seven hundred collected pupæ, one has both the left-side wings male, *i. e.* with the usual white rays characteristic of the sex, but the right-side wings female, *i.e.* without white rays, as is usual in that sex. Apparently it is a gynandrous specimen.—Geo. T. Porritt, Elm Lea, Huddersfield, September 4th, 1909.

CAPTURES AND FIELD REPORTS.

Sugar a Failure in June and July. — Mr. Everett (*antea*, p. 235) notes the scarcity of moths during the months of June and July in Cambs. My experience has been similar. I have "treacled" night after night without a single moth visiting the trees. This could hardly have been due to bad weather, as I caught a good number at "light" in these months, and treacle paid well from the middle of August to the beginning of September (I took about fifty on twelve trees on August 26th), although the weather has been almost as bad as in June and July. I think that as flowers have been abundant this season, in spite of the bad weather, the moths may have found them more attractive than artificial sweets.—H. P. Jones; Westwood, Woodlands Road, Gt. Shelford, Cambs.

Notes from Sidmouth.—I was pleased when at Weston Beach, near Sidmouth, on August 4th last to see a few examples of that now very local butterfly *Pararge egeria*. *Colias edusa* was there, too, but not in any numbers. *Adopœa actæon* occurred, but not at all freely, as can be judged from the fact that it took me two hours to get a dozen specimens, all of which were males, for the most part in only fair condition. *Pyrausta punicealis* was common amongst the thyme near the base of the cliffs.—F. G. Whittle; 7, Marine Avenue, Southend, September 7th, 1909.

Abraxas grossulariata ab. lacticolor.—On July 29th I took a perfect specimen of *A. grossulariata* ab. *lacticolor* Raynor, as figured on plate 104 in 'Moths of the British Isles' (second series), and I thought this occurrence might be sufficiently interesting to report.—P. H. Harvey; 9, Church Street, Warwick, August 27th, 1909.

Early Appearance of Triphæna pronuba.—Whilst sugaring on the 24th of April of this year for a female *munda*, although already rather late for that insect, I boxed a freshly emerged example of *T. pronuba*. Is not this an exceptionally early date for this species? Probably the mild spell in February may account for their early emergence.—R. T. Baumann; "Glendale," 70, Station Road, Chingford, Essex.

Abundance of Vanessa io.—The sudden appearance of *Vanessa io* in such numbers as it is at the present time is, I think, worthy of record after so many years of comparative scarcity. In South-east Essex it is in greater abundance than I have seen it since the "seventies." I hear it is very common in many places, and it would be interesting to learn if it is equally abundant throughout the country.—F. W. Frohawk.

Vanessa antiopa in Kent.—Mr. Siegfried Sassoon captured a specimen of *V. antiopa* on September 3rd last behind a blind of a skylight in his house at Paddock Wood, Kent. It is in fair condition, with cream-coloured margins; the blue submarginal spots are smaller than usual.—F. W. F.

Note on Nonagria geminipuncta.—While working for pupæ of this species at Lewes on the 31st July last, I cut one reed containing no fewer than nine pupæ. It is by no means uncommon to find two or three on one reed, but so large a number as nine is certainly more or less of a record. Can any of your correspondents go one better?—Hugh J. Vinall; Torbay, Park Road, Lewes.

Spilosoma lubricipeda var. zatima in Warwickshire.—About the middle of June last I had the good fortune to take, in the town street, a very nice specimen of the *zatima* form of *S. lubricipeda*. It was kept alive for a day or two in the hope of finding a typical female and so obtain a pairing if possible. In this, however, I was not successful.—C. Baker; 25, Long Street, Atherstone.

Daphnis nerii in Devonshire.—It may be of interest to record that a specimen of *Daphnis nerii* was caught at Ilfracombe on September 22nd. It was sitting on a fig-leaf in a garden there. When brought to me it was a little rubbed on thorax, and had one of

the antennæ damaged, but otherwise was a fine specimen.—E. S. Hebbert; Berrynarber S.O., Devon, September 25th, 1909.

Note on Eupithecia assimilata.—A vigorous hop, said to be of the kind known as the "Kentish Golding," was planted in the garden here about five years ago. The main object in growing it was to obtain a sun screen for the wooden construction in which are housed various boxes, cages, &c., used in rearing Lepidoptera. For this purpose it has proved very suitable, but since 1905 moths have found it a convenient shelter during the summer, and the larvæ of several species feed on the foliage; among the latter is *Eupithecia assimilata*, with which species the present note is more especially concerned. *E. assimilata* was first observed in the garden on July 1st, 1907, when a female specimen was noticed on the paling near which the hop grows. In 1908 a worn female was seen on the same fence in early June, and in July a few larvæ were found on the under sides of the hop-leaves. These produced moths the last week in July and early August. Over a score of larvæ were collected from the hop in the autumn, but the pupæ died during the winter. No example of the first flight of moths was seen this year, but on August 3rd a fine male was taken off the fence, and a worn one was noted on the 12th of the same month. Between July 20th and September 4th the foliage of the hop had been examined from time to time, and on each occasion larvæ were found. These were of all sizes, some being only in their first or second instar, whilst others were nearly full-grown. These various stages of growth were not only observed on the earliest date mentioned, but also on the later one. Between forty and fifty larvæ altogether were secured, and all the healthy ones have pupated; a rather large proportion were parasitised. One moth emerged on August 22nd, on which date several larvæ ranging in size from newly hatched to half growth were seen on the hop.

Presumably the two moths referred to as found on the paling and also the one that emerged in confinement were of the second generation—that is, descendants of parents that had wintered in the pupal state. It seems then that the first and second generations of larvæ have this year overlapped, and that larvæ of the second generation have been in point of time somewhat earlier than usual. Perhaps delay in the emergence of moths from some of the wintered pupæ, due possibly to unfavourable weather conditions, may have contributed to the overlapping. On the other hand, it is probable that some moths of the second generation may have been on the wing earlier than August 3rd, even about mid-July, and these have been the parents of the very juvenile larvæ found with the almost mature ones on July 20th.—Richard South; 96, Drakefield Road, Upper Tooting, S.W., September 22nd, 1909.

SOCIETIES.

The South London Entomological and Natural History Society.—*July 22nd*, 1909.—Mr. Alfred Sich, F.E.S., President, in the chair.—Mr. Edwards exhibited the closely allied species *Papilio niveus* and *P. erinus* from Africa, and pointed out the distinguishing

characters.—Mr. Turner, two specimens of *Cupido minima* from Winchester, measuring only 15 mm. in expanse. They were taken on June 12th with normally sized specimens.—Mr. Kaye, living larvæ of *Callophrys rubi*, pupæ of *Celastrina argiolus*, and a growing plant of *Erica ciliaris*, which had come up accidentally in peat in a cool orchid house.—Mr. Step, a coleopteron which had been attacked by a species of Ichneumon.—Mr. Adkin, a series of *Endromis versicolor*, being part of a brood from Aviemore ova; the rest were lying over in pupa. He also showed full-fed larvæ of *Nyssia zonaria* from Wallasey ova, and gave notes on their life-history.—Mr. Adkin gave a detailed account of the persistent attempts of a sparrow to get at a *Pieris brassicæ* fluttering along inside the glass roof of his conservatory. Several instances of birds attacking lepidoptera were given by other members.—Mr. Step read the Report of the Field Meeting held at Mickleham on June 19th.—Mr. Percy Richards communicated the Report of the Field Meeting held at Coombe Wood on July 10th.

August 12th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. Dennis, a specimen of the fuller's teasel, *Dipsacus fullonum*, from Halstead, Essex.—Mr. Baumann, a reed containing living pupæ of *Nonagria geminipuncta* from Lewes, and an ichneumon bred from a pupa.—Mr. Main, specimens of *Lasiocampa quercus* var. *callunæ* from Westmorland.—Mr. Step, a *Papilio machaon* mounted between glass for artistic purposes, which, although sealed up some eighteen months ago, had now produced a living imago of *Tinea biselliella*.

August 26th.—Mr. A. Sich, F.E.S., President, in the chair.—Mr. South exhibited, on behalf of Mr. Esson, a noctuid moth taken in Aberdeen, probably not only new to science but representative of a new genus. He also exhibited a slightly aberrant specimen of *Aglais urticæ* bred with a number of normal examples from larvæ fed solely on hop after first instar.—Dr. Chapman, a most aberrant form of *Parasemia plantaginis* taken at Ferpecle, Val d'Herens, Switzerland, in which the black markings were reduced to little more than a few faint brownish clouds, on pale orange fore wings and darker orange hind wings.—Mr. West, Greenwich, specimens of the local Homopteron *Paramesus nervosus*, from Gravesend, among rushes.—Mr. Newman, nearly full-fed larvæ of *Eupithecia extensaria*, reared *ab ovo* on garden *Artemisia*. He also showed a larva of *Stauropus fagi*, and pointed out its resemblance to a dead and distorted leaf of beech.—Mr. F. Noad Clark, a cluster of one of the bird's-nest fungi *Nidularia* found in a garden apparently attacking old wooden bordering.

September 9th.—The President in the chair.—Mr. Lucas exhibited the freshwater sponge *Spongilla fluviatilis*, interesting as the food of the genus *Sisyra* of Neuroptera. It was from the New Forest. He also showed the rare parasitic fungus *Cordiceps ophioglossoides* from Esher.—Mr. Tonge, living specimens of *Dytiscus marginalis* and *Locusta viridissima* from Deal, and an example of *Agriopis aprilina* which he had just bred.—Mr. Main, living specimens of the Javan cockroach, *Nauphœta circumvagans*.—Mr. Sperring, a short series of aberrant forms of *Arctia caja*, bred from larvæ whose food was varied from day to day.—Mr. Turner, a white aberration var. *alba* of *Rumicia phlæas*, from Brasted. He also showed a series of *Anthrocera carni-*

olica from Gex, S. Jura, together with *A. filipendulæ* and *A. achilleæ*. —Mr. Barrett, a number of species taken fifty years ago within 20 miles of London, and still obtainable on the same ground, including *Lithosia deplana*, *Hepialus velleda*, *Aventia flexula*, *Boarmia abietaria*, and *Psammotis* (*Botys*) *hyalinalis*. On the same ground he had this year taken *Argynnis adippe*, *A. aglaia*, and *Rivula sericealis* for the first time.—Mr. Goff, a green male, a mauve male, and a dwarf female (22 mm.) of *Agriades* (*Lycæna*) *bellargus* from Steyning, N. Devonshire. He also showed a dwarf *Euchloë cardamines* 28·5 mm. in expanse.—Mr. Pratt, a specimen of *A.* (*L.*) *corydon* taken on Wimbledon Common this year.—Mr. H. Moore, twigs of elm on which were the fig-like galls caused by the Aphis, *Schizoneura lanuginosa*, obtained at Larkfield, Kent.—Mr. Sich read the Report of the Field Meeting held at Reigate on June 24th.—Hy. J. Turner, *Hon. Rep. Sec.*

RECENT LITERATURE.

Catalogue of the Lepidoptera Phalænæ in the British Museum. Vol. viii. By Sir George F. Hampson, Bart. Pp. i–xiv, 1–583. With Atlas of fourteen plates in colour. London: Printed by Order of the Trustees. 1909.

As mentioned in our notice of vol. vii. of this important work, the author stated that the noctuid subfamily Acronyctinæ would occupy three volumes. In the volume now before us a further contingent of 723 species and 104 genera is comprised, thus bringing up the total number of species so far described in the subfamily to 1563. It is expected that vol. ix., the last of the three dealing with the Acronyctinæ will be published during the present year.

There are 43 genera with only a single species assigned to each. Of the 15 new genera the largest is *Omphaletis*, Hamps. (t. *florescens*, Walk.), comprising 11 species from Australia and *ethiopica*, n. sp., from British East Africa.

Over 120 species, chiefly North American, are here referred to *Acronycta*, Treit., and these are arranged in three sections as follows:—

Sect. i. *Hyboma*, Hübn. (t. *strigosa*, Schiff.) = *Viminia*, Chap. (type *rumicis*, L.).

Sect. ii. *Triæna*, Hübn. (t. *psi*, L.) = *Cuspidia*, Chap. (t. *psi*, L.).

Sect. iii. *Acronycta*, Treit. = *Acronicta*, Ochs. (t. *leporina*, L.).

The European species in Sect. ii. are *tridens*, Schiff.; *cuspis*, Hübn.; *aceris*, L. (type of *Arctomyscis*, Hübn., and of *Apatela*, Hübn., Tent.); *alni*, L. (type of *Jocheæra*, Hübn.); *auricoma*, Schiff. (type of *Pharetra*, Hübn.); *menyanthidis*, View.; *megacephala*, Schiff.; and *euphorbiæ*, Schiff. The North American species *cretata*, Smith, with *leporina*, L., constitute Sect. iii.

Another large genus is *Athetis*, Hübn. (t. *furvula*, Hübn., = *lenta*, Treit.). Among the 107 species embraced therein are *ambigua*, Schiff., *alsines*, Brahm., *blanda*, Schiff., *clavipalpis*, Scop., = *quadripunctata*, Fabr., and *morpheus*, Hufn.

Eridania, Cram., is fixed as the type of *Xylomyges*, Guen., a genus with only four species, all of which are South American.

The type of *Petilampa*, Auriv., is *minima*, Haw., = *arcuosa*, Haw., and *Acosmetia morrisii*, Morris, Naturl. ii. p. 88 (1837); Humphrey and Westwood, Brit. Moths, i. p. 245, pl. 54, fig. 12, is quoted in the synonymy.

The 89 species under *Monodes*, Guen. (t. *nucicolor*, Guen.), are divided up, on antennal characters, into four sections, but as regards the first two and the last, only one species is assigned to each. All the others are included in Sect. iii., and are largely South American species; *venustula*, Hübn., alone is European.

"*Agriopis*" *viridis*, Leech, is the type of *Daseochæta*, Warren (1907), and "*Diphtera*" *pallida*, Moore, the type of *Diphtherocome*, Warren (1907). The latter is merged in the former, and the two species mentioned with twelve others, including *alpium*, Osbeck, = *orion*, Esp., referred by authors to *Diphthera*, Hübn., are here included in one or other of the five sections of *Daseochæta*.

Gemella, Leech, originally described under *Perigea*, Guen., is the type of *Dysmilichia*, Speiser (1902); *Phalacra*, Staud. (1892), and *Milichia*, Sneller (1898), are both preoccupied names.

The 448 excellent figures in the Atlas, drawn by Horace Knight, are capitally reproduced in chromo by West, Newman & Co.

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1. *Appendages of the Second Abdominal Segment of Male Dragonflies (Order Odonata)*. By Oliver S. Thompson (New York State Museum, Bulletin 124, pp. 249–263). Albany. 1908.

This is a most useful paper on the unique structural arrangements for copulation in the Odonata. Forms of the appendages in the different divisions of the order are fully illustrated, but in some cases fuller references to the figures seem to be called for.

2. *Les Rhaphidides (Ins. Névr.) du Musée de Paris*. By Longinos Navas (Annales de la Société Scient. de Bruxelles, 28 Jan. 1909).

3. *Neurópteros y Ortópteros nuevos de Aragón*. By Longinos Navas (Boletin de la Soc. Arag. de Cien. Nat. May, 1909).

Perla kheili, amongst the Neuroptera, and *Omocestus rufipes* var. *rufitarsis*, *Stauroderus intricatus*, and *Pamphagus nugatorius* amongst the Orthoptera, are here described.

4. *Monografia de la Familia de los Dilaridos (Ins. Neur.)*. By Longinos Navas (Mem. de la Real Acad. de Cien. y Artes de Barcelona, June, 1909).

An important paper of fifty-five pages, with two plates, devoted to this strange and not too well known group of the Neuroptera (restricted sense). They are a small group of insects near the Hemerobii, chiefly found in the Old World. The male possesses pectinated antennæ, and the female has a long ovipositor.

W. J. L.

Obituary.—We have to announce, with very much regret, that Mr. H. W. Barker, F.E.S., died on September 21st.

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SOME AUGUST BUTTERFLIES OF CANTAL AND LOZÈRE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

SEEN on the map, the country to the south of Mont Doré, and especially that within the region of the mountains of Cantal, suggests tempting ground for entomologists who wish to add to their knowledge of the fauna of Central France—*terra incognita*, it seems, alike to French and British collectors. In bygone days one or two members of the Entomological Society of France appear to have given some attention to the butterflies of Cantal; and supplementary to Maurice Sand's excellent Catalogue I find a list of captures made at le Lioran by M. Achille Guenée. With this slight material before me I had intended to visit the higher parts of the range in the early months of the summer, but again a variety of causes conspired to keep me in England until August was well in sight. The delay was doubly vexatious. It deprived me of the companionship of Mr. R. S. Standen, one of the pioneers of Continental butterfly hunting, and also brought me to the appointed spot at a date when, as I was presently to discover, the better part of the local butterflies was over and done with. To stay more than a week in such a promising-looking locality as le Lioran and actually meet with no more than two members of the Lycænid family is an experience without parallel in the several expeditions I have been fortunate enough to make abroad in previous years. But it is a fact that, apart from a single battered *Lycæna arion*, I netted no other "blue" there except *Polyommatus alexis*, and this very rarely.

I travelled from Paris on the night of the 29th of July, and as I noticed on the return journey made by day, I had already passed through some fine scenery, when I awoke at Viescamp-sous-Jallès, the little junction where the main line to Figeac and Toulouse is crossed by the central road connecting Clermont-Ferrand and Bordeaux. Already the character of the country

was indicated: the heavily cultivated meadows and pastures strewn with occasional volcanic boulders; and, as the train laboured slowly up the steep gradient from Aurillac, accidental rocks and green-shouldered hills dignified by the name of mountains—the craters and cones of long-dead volcanoes. The country round Vic-sur-Cère, the only intermediate place of any importance, offers some good collecting-ground, as I found when I paid a day's visit there on August 4th; but the bad first fortnight of July which had brought such execrable weather even thus far south did not apparently affect the emergence of the local species, and, although *Polygonia c-album* and *Pamphila sylvanus* were still fresh, *Satyrus circe* was already *passé*, as well as most commoner things—*Pararge mæra*, &c. On the grassy slopes above the pretty village typical *Melanargia galatea* swarmed, and near a little spring, feeding quite a respectable cascade, I observed *L. alcon*, though never would the fast-flying males come within reach of the net. I mention these butterflies here because I did not meet with any of them except *M. galatea* higher up.

Le Lioran (3780 ft.)—with its several "Plombs," and on the eastern declivity of the massive central group connecting Auvergne with Lozère—by situation and the altitude of its mountains running up to something over 6000 ft., had conjured up visions of collecting by no means to be realized. I do not think I was ever in any place presenting such attractive features, and so well adapted, climatically speaking, productive of poorer results in Lepidoptera; and Mr. Paulson, who was in the hotel collecting botanical specimens, informed me that the same state of things ruled among the flowers and plants, which disposed of the idea that the phenomenal first fortnight of July alone accounted for the dearth. Brooms of all kinds I regard with suspicion, where they flourish to the exclusion of other shrubs, for it is really surprising how very few butterflies appear to be attracted on the sunniest days and in the warmest localities even by the luscious scented golden blossoms of the larger species. Here the dwarf *Genista sagittifera* was ubiquitous in the pastures and upon the hill-footways of Upper Cantal, and appeared as distasteful to insects as to cattle. Otherwise the pleasant note of colour struck by the flowers of alpine meadows elsewhere was wanting; only the close-cropped green turf getting browner and more barren as it approached the summit of the mountains.

My first day—in every respect an ideal day for collecting—I devoted to climbing the Plomb du Cantal, the highest peak, or rather cone, of the chain. The lower forests yielded practically nothing, except at one spot where a little spring had induced some growth of rank herbage. Here *Melitæa parthenie* in twos and threes was flitting about, and occasional *Chrysophanus virgaureæ*, the males of which, now and thereafter, proved to be the commonest

species on the wing. A little further up, *Erebia stygne*—the first *Erebia* of the year for me—put in an appearance, and was almost common at about 5000 ft. The form differs materially from that of Digne and the Midi—it is much smaller, and, I think, *blacker*—more resembling examples from the Vosges in my collection, taken last year by Mr. Barraud and Mr. Gibbs (*antea*, p. 115, &c.); the ocellations, moreover, are decidedly in-

(1) The two larger figures represent an aberrant form from Mende, Lozère, August, 1909 (the upper), and a normal form of *Polyommatus escheri* from St. Martin-Vésubie, Alpes-Maritimes. (2) The two lower figures represent (to the left) a normal form of *P. eros* from Pontresina, and a strongly marked under side aberration taken at Lac d'Allos, Basses-Alpes, August, 1908.

ferior, often reduced to the merest pin-points. Flying with it was *Erebia epiphron* var. *cassiope*, mostly of the form *nelamus*, Bsdv.; but several females taken show a remarkable fine band on the fore wings, with large spots, which might be regarded as var. *valesiana*, M-D., after Mr. Wheeler's description. But with these two butterflies, a single *Hesperia serratulæ* and a form of *H. carthami* with very pale under side coloration, the catalogue for the day came to an end, save for an extremely battered *Hipparchia semele* circuiting the topmost Plomb, where the tremendous wind which had sprung up effectually disconcerted both butterfly and

collector. Disappointed on this the southern side of le Lioran, I next experimented on the north, under and upon the well-wooded slopes which lead to the grassy plateau beneath the cone of the Puy Mary (5860 ft.). Three days in all I spent upon this ground, but again results were discouraging. However, there were rather more butterflies on the wing here when the furious wind permitted them to fly, and on the first occasion I discovered *Parnassius apollo* by no means uncommon, though unfortunately I captured but a single example worth bringing home, and this save in so far that it is more heavily scaled than my typical Swiss specimens presents no special characters. Indeed, nothing in Cantal I met with could be described as approaching a distinctive form, all the common August butterflies responding accurately to their typical representatives in the British Islands.

The downward road to Murat suggesting possibilities, I took special pains to work upon the verdant banks now thick with full-flavoured wild strawberries. *Erebia ligea* was not rare, and among the few things taken here I find a single example of *E. euryale*, while lower still I spent a fruitless hour endeavouring to stalk the apparently magnificent Apollos haunting the sides of a deep and almost inaccessible ravine. Later, a day spent at Murat produced nothing worth record, though it is mentioned by Sand as a locality for *E. neoridas*. Higher up *C. virgaureæ* was also generally common, and above the hotel one morning I took a single perfect example of *C. alciphron* var. *gordius*, save in smaller size presenting no superficial difference to the common form of the Midi. *Rumicia phlæas* also was rare and ordinary in appearance. In the roadside pastures, however, *M. galatea* was very abundant, with the common Hesperids, *Pamphila comma* and *Thymelicus lineola*. My Cantal catalogue, therefore, remains wholly incomplete, but, as indicating more fully the species to be met with at le Lioran, I include in the following short list some observations (marked *) made by M. Achille Guenée and M. Sand, at a time when I expect the country was more open and wild, and the excellent cheese of the Department, therefore, a less conspicuous feature at *tables d'hôte* all over the central and southern regions:—

Hesperiidæ.—*Carcharodus lavateræ*, Murat,* *Hesperia carthami*, *H. alveus*, *H. serratulæ*, *H. cacaliæ** (??); *Pamphila sylvanus*, *P. comma*; *Thymelicus lineola*, *T. actæon*.

Papilionidæ.—*Papilio podalirius* and *P. machaon* (? le Lioran)*; *Parnassius apollo* (Murat, Sand); *Aporia cratægi**; *P. napi* var. *bryoniæ** ; *Colias edusa* ; *Gonopteryx cleopatra*, valley of the Alagnon, Murat.*

Lycænidæ.—*Chrysophanus virgaureæ*, *C. hippothöe*, Murat,* *C. alciphron* var. *gordius*, *C. phlæas* ; *Lycæna arcas*, Murat,* *L. euphemus*,* *L. alcon* (Vic), *L. arion* ; *Cupido sebrus*, Murat* ;

*Nomiades semiargus**; *Polyommatus damon*, Murat,* *P. hylas*, Murat,* *P. escheri*, Murat,* *P. alexis*.

NYMPHALIDÆ. — *Melitæa parthenie*, *M. athalia**; *Argynnis aglaia*,* *A. niobe*,* *A. adippe*; *Issoria lathonia*; *Brenthis euphrosyne*; *Polygonia c-album* (Vic), *Pyrameis cardui*, *P. atalanta*; *Vanessa io*; *Aglais urticæ*.

SATYRIDÆ.—*Satyrus circe* (Vic); *Hipparchia semele* (one); *Erebia epiphron* var. *cassiope*, *E. ceto*, Murat* (rather doubtful, I should think, more likely to be *E. medusa*), *E. styyne*, *E. euryale*, *E. ligea*, *E. æthiops*,* *E. neoridas*, Murat.*

With regard to some of the records, that of *H. cacaliæ*, reported from Murat, must be accepted with reservation. This "skipper" is essentially alpine. Murat is but 3000 ft. above sea-level, and the nearest mountain of any altitude is the Puy Griou (5560 ft.). The two or three *Pieris napi* observed by me on the Plomb du Cantal were typical, but no doubt the form *bryoniæ* might occasionally be developed here.

(To be concluded.)

LUPERINA NICKERLII, FREYER, AB. OR NEW SPECIES?

By RICHARD SOUTH.

TWENTY years ago Mr. T. Baxter sent to me, for identification, a specimen of a *Luperina* that he had captured at St. Annes-on-Sea, Lancashire.

After comparing the insect with some examples of *L. nickerlii* then in the collection of the late Mr. J. H. Leech, now in the National Collection, I concluded that the Lancashire specimen was a form connecting *nickerlii* with *gueneei*, Doubleday, and that all were therefore forms of *L. testacea* (Entom. vol. xxii. p. 271).

In 1891 Mr. Baxter obtained another specimen similar to the first but having an ochreous tinted pale greyish coloration, and this, I believe, was the type of *L. testacea* var. *incerta*, Tutt (Brit. Noct. vol. i. p. 140).

During September last Mr. Baxter and a friend—Mr. W. Gates—secured at least a dozen specimens. Two males were submitted to Mr. F. N. Pierce, the well-known author of 'The Genitalia of the Noctuidæ,' and he reports that the insects are certainly not referable to *L. testacea*. He is now most anxious to obtain one or two male specimens of *nickerlii* and also of *gueneei*. It is to be hoped that the necessary material will be available so that the question of variety or species may be definitely settled.

Gueneei is generally recognized as a form of *L. testacea*, but it might equally well be set down as a form of *L. nickerlii*. The Lancashire specimens, in fact, certainly seem to connect *gueneei* with *nickerlii*, and until it can be shown that these two can be separated one from the other, and from the Lancashire *Luperina* on structural differences in genitalia, I am inclined to accept all three as forms of one species.

If it should subsequently be established that Mr. Baxter's *Luperina* is specifically distinct from both *nickerlii* and *gueneei*, then it will have to be known as *L. incerta*, Tutt, and I propose to name the paler greyish specimens taken this year ab. *baxteri*.

Some figures of the moths are being prepared, and these, together with drawings of Mr. Pierce's preparations of the genitalia, will be published in the 'Entomologist' for December.

THE ORDERS OF INSECTA.

By D. Sharp, M.A., M.B., F.R.S., &c.

The question of the number of Orders that should be adopted in the Class Insecta has been much discussed, and a considerable variety of views expressed about it. The subject has just been treated by Handlirsch in his great work on Fossil Insects, and it will no doubt be of interest to enumerate the Orders he adopts for existing insects. They amount to no fewer than thirty-five, *viz.* :—

1. Arthropleona.
2. Symphypleona.
3. Dicellura.
4. Rhabdura.
5. Machiloidea.
6. Lepismoidea.
7. Gastrotheoidea.
8. Orthoptera.
9. Phasmoidea.
10. Dermaptera.
11. Diploglossata.
12. Thysanoptera.
13. Mantoidea.
14. Blattoidea.
15. Isoptera.
16. Corrodentia.
17. Mallophaga.
18. Siphunculata.
19. Hymenoptera.
20. Coleoptera.
21. Strepsiptera.
22. Embioidea.
23. Perlaria.
24. Odonata.
25. Plectoptera.
26. Megaloptera.
27. Raphidioidea.
28. Neuroptera.
29. Panorpatæ.
30. Phryganoidea.
31. Lepidoptera.
32. Diptera.
33. Suctoria.
34. Hemiptera.
35. Homoptera.

A few words of explanation and comment may be acceptable about this very formidable list. Nos. 1 and 2 are the two great divisions of the old Order Collembola ; 3 and 4 are the Campodeid forms, *Japyx*, *Campodea*, &c. ; 5, 6, and 7 are divisions of Thysanura (7 being altogether doubtful), the old name Thysanura being still used by Handlirsch as that of a "Class" composed of these three Orders; 8, Handlirsch limits the Orthoptera to the old Saltatoria, treating each of the other great divisions (*viz.* 9, 10, 11, 13, and 14 of our list) as a separate Order, and interpolating

12, Thysanoptera, among them; 15, Isoptera or Termites; 16, Corrodentia limited to Psocidæ; 17 to 25 call for no remark; 26 consists of the forms allied to *Sialis* and *Chauliodes*; 27 includes only Raphidiidæ; 28 consists of Hemerobiid forms; of 29–35 it is only necessary to remark that the name Suctoria is applied to the fleas.

For Handlirsch's purposes it was desirable to adopt more Orders than are perhaps really necessary from the morphological and developmental points of view, and I think the following list may be considered sufficiently ample at the present day, *viz.*:—

THE ORDERS ARRANGED.

APTERYGOTA.	
1. Collembola (or Apontoptera or Synaptera). 2. Campodeioidea. 3. Thysanura (or Aptera).	Wingless insects supposed to have descended from wingless ancestors.
ANAPTERYGOTA.	
4. Mallophaga (or Lipoptera). 5. Anoplura (or Ellipoptera). 6. Siphonaptera (or Aphaniptera).	Wingless insects whose ancestors were probably winged.
EXOPTERYGOTA.	
7. Orthoptera. 8. Plecoptera. (=Perlaria.) 9. Psocoptera. (=Corrodentia.) 10. Isoptera. (=Termites.) 11. Embioptera (or Embioidea). 12. Ephemeroptera. (=Plectoptera.) 13. Odonata (or Paraneuroptera). 14. Thysanoptera. 15. Hemiptera.	Winged insects whose wings develop outside the body.
ENDOPTERYGOTA.	
16. Neuroptera. (=Planipennia.) 17. Trichoptera. 18. Lepidoptera. 19. Coleoptera. 20. Strepsiptera. 21. Diptera. 22. Hymenoptera.	Winged insects whose wings arise as invaginations of the hypodermis, and for a time project within the body.

In view of the great advantage of having a uniform system of terminations, I have added in this list certain alternative names in brackets. They are mostly those proposed by Prof. Shipley in Zool. Anz. xxvii. 1904, and made use of in Prof. Sedgwick's recent 'Text-book of Zoology,' vol. iii. 1909.

A NEW SPECIES OF *MORPHOTENARIS* FROM DUTCH NEW GUINEA.

By Percy I. Lathy, F.Z.S., F.E.S.

Morphotenaris adamsi, sp. nov.

♂. Upper side. Fore wing pearly white; a wide curved fascia from base to inner angle, the part within cell being blackish brown and beyond cell orange-brown. Hind wings pearly white, with tuft of brown hairs near base and below cell. Under side. Fore wing as above, but fascia darker in colour, and above fascia three submarginal white-centred black spots. Hind wing white, tinted with ochreous, particularly along costa and inner margin, a series of five submarginal ocelli, of which the upper is the largest and the next two smaller than the two lower ones; these ocelli are ochreous, faintly ringed with black, and contain a white-centred black spot.

♀. Similar to ♂ but larger, the orange-brown of fascia more suffused with black, and no tuft of hair on hind wings. Exp. ♂ 110 mm. ♀ 128 mm.

Hab. Ninay Valley, Dutch New Guinea.

This fine new species was captured by Mr. A. E. Pratt, during the months of November and December, 1908, and January, 1909, at an elevation of 3500 ft. Mr. Adams' series consists of one male and eight females.

The nearest ally is *M. schonbergi*, Fruhst., from which it may easily be distinguished by parti-coloured fascia, the black spots on fore wings below, and smaller ocelli of hind wings below.

SIX WEEKS AMONGST HUNGARIAN BUTTERFLIES.

By W. G. Sheldon, F.E.S.

(Continued from p. 251.)

On June 14th we entrained for Herculesbad. I had been told by Budapest entomologists that the season in Hungary was a bad one, but not until Herculesbad was reached did I realise how bad it was, for there, in my judgment, not more than twenty-five per cent. of the specimens I ought to have met with were seen—a calculation made by comparing the results of those British lepidopterists who had preceded me with my own.

I should strongly recommend anyone working Herculesbad to secure at the outset a very good map of the district, which can be purchased at the Bazaar for two krones = 1*s.* 8*d.*, and which shows the position of the various localities well known to lepidopterists, but otherwise difficult to determine.

We spent several days collecting by the road (above Herculesbad) which traverses the Cserna valley. Here *Neptis aceris* was common, but worn; which was only natural, for Dr. Fischer, whom we met and who kindly gave us the benefit of his experience at Herculesbad, informed me that the first brood is often out by the end of April, and I understood that to get it in perfect condition one ought to be in its locality not later than the middle of May. Here, also, were *Brenthis daphne* in plenty—with *Melitæa athalia* and var. *mehadensis* the most abundant butterflies. *Lycæna arion*, a small obscure form, occurred in a dingle where a stream crossed under the road just beyond a hot sulphur spring, where also *Ereres argiades* var. *coretas* was not infrequent, and a solitary example of *Brenthis hecate* was netted, the only one seen in the district. A clearing on the left side of the road, just before we reached the dingle, was gay with flowers and large numbers of Lepidoptera, including several examples of *Carcharodus altheæ*, a species that has always been rare with me, and one or two *C. alceæ*; a fine form of *Chrysophanus virgaureæ* occurred, and plenty of *Thecla acaciæ*, *T. ilicis*, and *T. w-album*; near this spot, too, *Chrysophanus alciphron* was common. On comparing my specimens of this species from the three localities in which they were taken, I found a rather striking difference between them. Those from Pészer are the most extreme of the three, with the strongest purple tinge and the least indication of copper in both sexes; those from Herculesbad had the purple less strongly developed, with a much larger amount of copper; and one example that I saw some 2000 ft. above Herculesbad, but did not capture, struck me as very little darker than some Swiss *C.* var. *gordius* that I have seen; the Szada specimens are intermediate between those from the other two localities.

A couple of *Limenitis populi* var. *tremulæ* were taken at rest on the road near the town; and two or three *Apatura ilia* var. *clytie* were observed in the same place. Mr. Tylecote the day before he left for England (June 22nd) captured on the road, about a mile above Herculesbad, a fine *Eugonia xanthomelas*, the only example either of us came across, though Dr. Fischer informed me that a Hungarian lepidopterist, a few days before our advent at Herculesbad, had taken several.

A fine brood of *Polyommatus orion* var. *ornata* was abundant, generally extending as high as the Quelle. Amongst the species not usually recorded from Herculesbad was a specimen of *Chrysophanus thersamon*, taken on June 29th in good condition

in one of the meadows on the Coronini hill; probably one of a second brood.

Pieris napi var. *napææ* was abundant everywhere, especially in the ravine leading up to the Quelle; the examples were large, many of them having an expanse of 55 mm., whilst one expands 57 mm., and the females were heavily spotted. From ova deposited by captured females I reared a few examples after my return home; these were var. *napææ* of course, and closely resembled their parents. At the higher levels on the first few days of my visit I came across a few typical specimens; evidently these belonged to an earlier brood; they were not in good condition.

Pieris rapæ was equally abundant with its relative, but did not, within my observation, extend much above the valley. The form was a very handsome one, with pronounced black tips to the front wings, brilliant canary under sides to hind wings, and heavily spotted females.

I spent the morning of June 17th on the Coronini hill, but did not add much to my knowledge or collecting-boxes, for the day was unfavourable and the grass in the meadow had been cut. Doubtless earlier in the summer the hill is more prolific.

I was told at Budapest that *Thais polyxena* did not occur at Herculesbad, and was therefore surprised to find that the larvæ were quite abundant on the banks of the Cserna just below the town. A species I much wanted was the elusive *Libythea celtis*, which almost eluded me, for although several specimens were seen near the town on June 21st, and one was netted, they disappeared from there mysteriously the next day, and except for one taken at the Domogled Quelle on June 22nd I did not see another example. Evidently there was an emergence about June 20th, the specimens of which seem to have migrated to another locality a day or two afterwards.

After June 21st all the better insects deserted the roads, and I had no option but to work the higher ground. The best collecting at Herculesbad seems to be centred upon the slopes of the Domogled, a mountain which lies south-east of the town, and rises to some 3000 ft. above it. Mr. Jones in 1907 having made a very successful ascent of this mountain under the auspices of a local guide, Nicholas Kolopenza, I thought I could not do better for a start than to send for him, and stipulate that I should go up the mountain by the road Mr. Jones had patronized. I am afraid, however, something went wrong, for I was taken down the road leading to the station for a mile or so until we got to a place where some mining operations were going on; here we assaulted the mountain from the south-west, a very steep, dry, hot route, on which I did not see a single butterfly I wanted, and by the time the summit was reached I had had enough of it. After my experience I should advise anyone work-

ing the Domogled to steadfastly refuse to go up by any other way than that past the Weisses Kreuze; the path by this route is good, the slopes are easy, one is in shade practically all the way, and, best of all, the butterflies that affect the mountain are there found most abundantly.

My chief object in working the Domogled was to obtain a good series of *Neptis lucilla*, which is usually abundant there, though rare in the Cserna valley; judging by Mr. Jones's experience I ought to have obtained my object in one journey; I did certainly eventually obtain about two dozen fine examples, but I made eight ascents for them, during which I calculate I climbed not less than 18,000 ft. I suppose the books are right in giving the food-plant of this species as *Spiræa salicifolia*, and that of *N. aceris* as *Orobus vernus*, but I could not see anywhere at Herculesbad a plant that I should consider a *Spiræa*, nor did I ever see a specimen of *Neptis aceris* near a plant of *Orobus vernus*, which was abundant in certain places there. The habits and haunts of both these butterflies are similar, except that *Neptis aceris* rarely rises much above the Cserna valley, whilst *N. lucilla* is scarce until one gets up at least 1000 ft. Both seem to delight in small clearings in the forest, and if one of these is found overgrown with *Clematis vitalba* or bramble, one or two specimens of a *Neptis* is pretty sure to be there sailing slowly round the bushes on motionless wings, except for an occasional flap to give impetus, and from time to time settling upon some spray or approaching the resting place of another specimen, which will thereupon rise and toy or fight with the intruder, both soaring to a considerable height, then separating, and each proceeding on its way, which did not usually take it out of the clearing. Both species not infrequently settle on the ground in dry weather, probably for the sake of moisture they find there. The flight being so slow would lead one to suppose they are easy to capture; this is not so, however; the very slowness of the motion leading one to strike in advance, and at *Neptis lucilla* especially I missed quite a number of apparently ludicrously easy shots.

Beyond *N. lucilla* I did not see much of note on the Domogled; most of the species previously noted in the Cserna valley were there in some numbers, and on the peak itself *Erebia medusa* var. *psodea* was not infrequent, the males in bad order, the females fairly fresh; this species was not confined to the peak, one example being netted by Mr. Tylecote a few hundred feet above Herculesbad, whilst I found two or three in an alpine meadow on the way up the mountain at an altitude of about 2000 ft. On the peak *Melitæa trivia* was fairly common, and still in good condition on June 21st. The Quelle clearing, where in most years good insects usually swarm, was an extraordinary failure, and beyond a few *M. maturna*, one example of

Libythea celtis, and two *Neptis lucilla* I saw there absolutely nothing I cared to net.

One of the chief entomological lions of Herculesbad is of course *Pararge roxelana*, which is hardly known to occur elsewhere in Europe outside the Balkans. This fine species is found in most of the woods, possibly in all of them, up to six or seven hundred feet above the river, but the best locality is said to be the wood in which is the path leading up to the Weisses Kreuze. At Herculesbad it is essentially a wood frequenter, seldom being seen in the open. The ground is exceptionally difficult to work, for it slopes up at an angle of from 50° to 60°, and following a lively butterfly, which *P. roxelana* is, under those conditions is absurd; one's only possible plan therefore is to try to find a level spot in his haunts, and to endeavour to net him as he passes it. Such an opportunity is offered by the path leading up to the Weisses Kreuze. The orthodox manner of catching *P. roxelana*, I was told, is to watch until he settles on a tree-trunk, and then to cautiously put your net over him, holding the end of the bag in the left hand to enable him to fly into it, when of course the rest is easy to perform. This is admirable in theory, and possibly under certain conditions, such as large trees and small nets, it might act; but I tried it on half a dozen occasions, and missed as many butterflies. The large trees in the Kreuze wood are mixed with a great number of small ones, and *P. roxelana* would invariably insist upon resting upon these latter, with the result that when I had succeeded in covering the front door with the net the intended victim just quietly slipped out by the back. There are, however, certain conditions under which *P. roxelana* is as tame and stupid as a barndoor fowl, though he is usually as lively and wild as a March hare. On a certain day I was descending from the Domogled towards noon, and whilst in the higher part of the Kreuze wood was overtaken by a terrific hailstorm, during which I obtained what shelter I could from a bush and a bicycle cape. Whilst the storm was at its height to my amazement a magnificent *P. roxelana* fluttered down from somewhere, and settled on the ground within a yard of me. I made no mistake with him!

(To be continued.)

ON THE HYMENOPTEROUS PARASITES OF COCCIDÆ.

By Claude Morley, F.Z.S., F.E.S.

(Continued from p. 257.)

23. *Chionaspis pinifoliæ*, Fitch.*

In America, Howard (Revis. p. 21) says *Perissopterus pulchellus*, How., and *Aphelinus mytilaspidis*, Baron (*l. c.* p. 25),

attack *C. pinifolii*, ?Baron; while in Europe *Prospalta aurantii*, How., is said by Dalla Torre (Cat. v.) to have been bred from *Leucaspis pinifoliæ*.

24. *Chionaspis furfurus*, Fitch.*

Ablerus clisiocampæ, Ashm., originally bred from Bombyces, is said to prey upon this species by Howard (Revis. p. 42).

25. *Chionaspis euonymi*, Comst.*

In the same paper (p. 27) *Aphelinus fuscipennis*, How., is recorded hence.

26. *Chionaspis quercus*, Comst.* 27. *C. americana*, John.*

Both these species are attacked by *Physcus variicornis*, How. (Revis. p. 43).

28. *Chionaspis permutans*, Green.*

Aphelinus mytilaspidis, Baron, is the only parasite known from this host (Howard, Revis. p. 25).

29. *Chionaspis eugeniæ*, Mask.*

The cosmopolitan *Arrhenophagus chionaspidis*, Aur., is recorded hence by Ashmead (1900, p. 409).

30. Mytilaspis.

From an unnamed species of this genus on *Salix* Howard records (Revis. p. 26) *Aphelinus abnormis*, and from another specimen of the same genus (*l. c.*) his *A. diaspidis* was bred.

31. *Mytilaspis pomorum*, Bché.

Several parasites have been described from this destructive species in America: *Aphelinus abnormis* (How., Revis. p. 26), *A. fuscipennis* (*l. c.* p. 27), *A. mytaspidis* (*l. c.* p. 25), *Chiloneurus diaspidinarum*, How. ('Insect Life,' 1894, p. 256), and the Proctotrypid, *Anaphes gracilis*, How. (Report Ent. U. S. Dept. Agric. 1881, p. 370).

32. *Mytilaspis gloverii*, Pack.*

Ashmead assigns his Floridan *Signiphora flavopalliata* (1900, p. 411) to this species, and *Aphelinus fuscipennis* is also recorded from it by Howard (Revis. p. 27).

33. *Mytilaspis beckii*, Newm.*

From *Aspidiotus citricola*, Pack., Ashmead ('Orange Insects,' 1880, p. 31) gives *Signiphora flavopalliata*; Howard adds *Prospalta aurantii* (Revis. p. 41), *Aphycus flavus* (Report Ent. U. S. Dept. Agric. 1881, p. 365), from the West Indies; and his *Signiphora flavopalliata* is said to also prey upon it by Ashm. (p. 411).

34. *Mytilaspis concolor*, Ckll.*

From *M. albus* var. *concolor*—now considered a good species—his *Prospalta aurantii* is given by Howard (Revis. p. 41) from North America.

35. *Mytilaspis eucalypti*, Crawf.*

This species is attacked in Australia by the same parasite as the last.

36. *Eriopeltes lichtensteinii*, Sign.*

Gaulle (Cat. 99) gives this species, under the genus *Eriophorus*, as destroyed by *Sceptrophorus cyanifrons*, Dalm., in France.

37. *Eriopeltes festucæ*, Fonsc.

The same author brings forward (p. 106) *Aphelinus abdominalis*, Dalm. (*nec* Nees) as a parasite of *Coccus festucæ*, but later (p. 97) simply instances *Ectroma rufum*, Dalm. (*lindus*, Walk.) and *Bæocharis pascuorum*, Mayr., as attacking Coccids on grasses.

38. Ceroplastes.

Unspecified members of this genus are said by Ashmead to be attacked by *Asteropæus primus*, How., in Mexico (p. 405), and *Aphycus mexicanus*, How. (p. 387 et Revis. Aphel. 1895, p. 22).

39. *Ceroplastes rusci*, Linn.*

C. artemisiæ, Riley (et ? Rossi) is destroyed by *Aphycus ceroplastis*, How., according to that author (Descr. N. Am. Chal. 1885, p. 18).

40. *Ceroplastes cerripediformis*, Comst.*

The parasite of this species is *Aphycus mexicanus*, in North America (Ashm. 1900, p. 387).

41. *Ceroplastes actiniformis*, Green.*

Howard records (Proc. U. S. Nat. Museum, 1896, p. 633) this as the host of *Coccophagus orientalis* in Ceylon.

42. *Vinsonia stellifera*, Westw.

And, in like manner (p. 639), *Anicetus ceylonensis*, How., preys upon this species.

(To be continued.)

CONTRIBUTIONS TO A KNOWLEDGE OF ETHIOPIAN ECONOMIC ENTOMOLOGY.

By W. L. Distant.

COLEOPTERA.

Curculionidæ.

Apion armipes, Wagn.

I have received some specimens of this species (identified for me by Mr. G. J. Arrow) from Mr. Kenneth J. Cameron, which is

a pest to cotton near Zomba, Nyasaland. Mr. Cameron, writing under date of August 2nd, 1909, says:—"Fully a month ago I found what I considered to be a small weevil crawling along a cotton plant. I found them in the stem just on the point of emerging, but not until a week ago had I time to collect sufficient specimens to send you. These weevils do most damage just where the cotton-stem enters the soil, but I find they are also in the joint of stem and branches, or what was at one time a branch bud. I am afraid this plague is more serious than I at first anticipated. It may be a difficult matter to keep a cotton plantation clear of them." Mr. Cameron also sent me a piece of cotton-stem showing holes made by the weevil when emerging from cell, and another "with insect formation or cell, like that on beans."

Alcides arcuatus, Boh., var.

This beetle (identified for me by Mr. Guy Marshall) was also received from Mr. Cameron. He informs me:—"For some years back I am aware that a beetle lays its eggs in bean-stems when the bean is only a few weeks old. The larvæ from these eggs live on or consume the bean-stem, and thus reduce the crop considerably. At times, with the cutting up of this beetle to lay its eggs, the stems become broken down; at other times the larvæ to the number of ten, sometimes even twelve, develop in the stem without much apparent notice, unless attention is directed to it. About the time the beans are fully ripe the larvæ have assumed the perfect condition, but can easily be destroyed before that time. However, the cultivation of beans in this country, so far, is of little importance."

RHYNCHOTA.

HETEROPTERA.

Fam. Lygæidæ.

Oxycarenus gossipinus.

Oxycarenus gossipinus, Dist. ('Entomologist,' 1906, p. 269).

This species, already recorded as a cotton pest from West Africa, may now—from specimens since shown me by Mr. G. C. Dudgeon—be also known as injurious to *Hibiscus esculentus*,* the pods of which it infests. The specimens recently brought home by Mr. Dudgeon are rather larger than the typical ones previously described, and measure from $3\frac{1}{2}$ to 5 millim., while the margins of the pronotum are concolorous.

O. exitiosus, Dist. ('Entomologist,' 1905, p. 169) has already been recorded as injurious to the peach, and destructive to cotton-seed.

* Another Rhynchotan species (*Dysdercus cingulatus*) is a pest to Bhindi (*Hibiscus esculentus*), in India.—*Cf.* Maxwell Lefroy, Agricultural Research Institute, Pusa. Bull. x. (1908).

NOTES AND OBSERVATIONS.

British Carabidæ.—I am making an inquiry as to the variation of the wings in Carabidæ, and so far as I have gone at present the results are promising to be of interest. But I cannot hope to make it satisfactory without the assistance of other entomologists, and I shall be greatly obliged if anyone will send me fresh specimens. I prefer them unmounted, and they should not be kept long in laurel. One of the points is whether there is local variation. Specimens of species, even the commoner, from out-of-the-way localities would be very acceptable. Specially glad should I be to receive localised species, which we may presume to be isolated from other colonies of the same species.—D. Sharp; Brockenhurst, October 11th, 1909.

Acidalia degeneraria in Devonshire.—Last year Mr. J. Walker, of Torquay, was good enough to send me a pair of *A. degeneraria* that he had reared, with others, from eggs laid by a female moth captured in the Torquay district. Just recently he forwarded two other specimens that he had netted during the present year; these are a trifle larger but not so good in condition as the bred examples. Mr. Walker states that he first met with the species in 1897, but did not see it again until 1904. "Since 1904," he writes, "I have taken and bred them from wild females every year." He considers that *A. degeneraria* in Devon is of a different form to that occurring in Portland, and thinks that it should have a varietal name. Except that the purplish bands are dusky rather than reddish tinged, I do not find any particular difference between Torquay specimens and examples of a second generation from Portland parents, reared in September, 1904, by Mr. Hyde, of Weymouth.—Richard South.

Zephyrus betulæ, ab.—I should like to record the following:—From some larvæ of *Z. betulæ* obtained last June near Peterborough I have bred a female imago which has an orange band along the entire costal margin, tapering to a point at the tip of the wing, and reaching in width to the orange blotch in the middle of the wing. The hind wings are rather thickly sprinkled with orange, and the specimen is somewhat small, about the size of the male.—J. B. Morris; 14, Ranelagh Avenue, Barnes, October 14th, 1909.

The Generic Name Lomographa.—There is a serious discrepancy in the usage of the name *Lomographa*, Hübner ('Verzeichniss,' p. 311) by our leading workers. It was originally a mixed genus, consisting of *bimaculata*, Fab. = *taminaria*, Hüb., *trimaculata*, Vill. = *permutaria*, Hüb., and *lævigata*, Scop. = *renularia* et *lævigaria*, Hüb., and was allowed to lie dormant until Meyrick (Trans. Ent. Soc. Lond. 1892, p. 110) resuscitated it for *trimaculata* and its congeners, removing the other two. Thus *trimaculata* ought to be the type of the genus, and I beg to "select" it as such, in accordance with the requirements of the International Code, unless this be considered to have been done already by Meyrick. Warren has been using the name erroneously in place of *Bapta*, Steph., and has a note in Nov. Zool. vi. p. 342; he ignores Meyrick's first work (published March, 1892), though referring to a later one (June, 1892), and his suggestion that *bimaculata* is "the proper type of *Lomographa*" is untenable.

He does not seem to "select a type," but merely bases his assumption on a mechanical rule of "first species = type," which has no force; Grote's citation of *temerata* as type (Allg. Zeit. Ent. vii. p. 471, 1902) is of course *ultra vires*, and Meyrick's usage has seven years' priority over Warren's and ten over Grote's. The correct synonomy is :—(1) *Bapta*, Steph. (1831) = *Corycia*, Dup. (1829, nom. præocc.) = *Lomographa*, Warr., Grote (nec Hüb., Meyr. restr.), type *bimaculata*, Fab. (2) *Lomographa*, Hüb. (1826 ?, Meyr. restr.) = *Stegania*, Guen. = *Terpnomicta*, Led., type *trimaculata*, Vill. — Louis B. Prout; 246, Richmond Road, N.E., October 13th, 1909.

The Food-Plant of Lycæna pheretes.—I have been reading in the 'Entomologist' (*antea*, p. 221) of Dr. Chapman's interesting discovery that *Soldanella alpina* is the food-plant of *Lycæna orbitulus*. I feel that I should put on record that on July 15th of last year (1908), in the Roseg Thal, Ober-Engadin, I found *L. pheretes* in considerable numbers on a very limited area of ground, and always associated with *Astragalus alpinus*, L. (*Phaca astragalina*, DC.). It was a damp dull day, and late in the afternoon, and I did not see the females laying on the plant while at large; but several females, which I easily boxed, when in captivity afterwards laid very freely on sprays of the plant, while only one ovum was placed upon a piece of *Lotus corniculatus* which I offered them in addition. The larvæ fed freely on some *Astragalus* which I brought home, but I was unwisely tempted to try to rear too many for the plants, and when the latter were eaten I could find no allied plant, either in my own rock-garden nor in several of our English nurseries, that would satisfy them, and one by one the larvæ disappeared—hybernated, as I hoped. But none showed when spring came round, and I think they perished before they were ready to go into winter quarters. When I saw them last some of the larvæ were in their third stage; they closely resembled the pale green hairy pinnas of the *Astragalus* foliage. This fact, coupled with their unwillingness to take to any of the several other dwarf plants of the family which I offered them, justifies me, I think, in assuming that this is the food-plant of *L. pheretes*.—W. H. St. Quintin; Scampston, York.

Cucullia umbratica, a Fertilizer of Orchis maculata.—At Onich, Inverness-shire, in August, I found at rest on a post a specimen of the above moth with one of the pollen masses of the orchid named attached to the head just above the eye. The observation is of interest, since the chief authority on this subject, Hermann Müller, gives no lepidopterous visitors for the orchid in his 'Fertilization of Flowers' (1883). C. Darwin records as insect visitors Cerambycidæ and humble-bees, and Empidæ (George Darwin). Müller says the flower is chiefly visited by Diptera. The only orchid in flower at the time of the observation was *O. maculata*, which was quite common in the district. A comparison of the pollen mass on the moth with some extracted from the flowers proved their identity. My earliest recollection of *C. umbratica* as a flower-frequenting species was during the summer of 1868, when I first commenced collecting. The moth was seen every evening in abundance over the honeysuckle growing in our garden at Leyton, in Essex.—R. Meldola; 6, Brunswick Square, W.C., October 16th, 1909.

CAPTURES AND FIELD REPORTS.

Extraordinary Abundance of, and Destruction by, the Larvæ of Pieris brassicæ.—One noticeable entomological feature of the past autumn has been the extraordinary abundance of the larvæ of *Pieris brassicæ*, which have done an immense amount of injury to cabbage and other cultivated plants of the *Brassica* genus in fields and gardens. A farmer told me of an instance where six acres of kale were completely destroyed by these caterpillars; every leaf had been devoured, the stalks alone remaining, which presented a curious and melancholy spectacle. The larvæ have committed great havoc with the cabbages in our own gardens.—Joseph Anderson; Chichester.

Larva of Manduca atropos at Chichester.—A larva of *Manduca atropos* just on the point of pupating was brought to me on September 16th. It was dug up with potatoes. The interference was probably inopportune, and resulted in death before the last ecdysis. This is the only instance of the occurrence of *Manduca atropos* in any stage known to me this year in this locality.—Joseph Anderson; Chichester.

Apatura iris and Vanessa antiopa in Essex.—A female specimen of *Apatura iris* was seen in this neighbourhood this summer by a young collector, Mr. Webster. It had settled on the ground but a short distance from him. As there is a good deal of oak and some sallow in the vicinity, it is quite possible that this was a wild individual. Mr. P. I. Lathy informs me that he saw a specimen of *Vanessa antiopa* at Broxbourne. Another individual of this species was observed within the precincts of the Royal Small Arms Factory at Enfield.—George Talbot; 11, Palace Gardens, Enfield.

A Few Insects from Braemar.—Dr. D. Sharp was kind enough to give me a few insects which he took at Braemar in June of this year. They were:—Neuroptera: *Raphidia maculicollis*, two males and two females, together with a female pupa. Plecoptera: *Dictyopteryx mortoni*, five males and a female; *Dictyopterygella recta*, a nymph almost certainly, and three imagines; *Chloroperla grammatica*, one; *Tæniopteryx risi*, two; *Nemoura variegata*, a male and a female. Trichoptera: *Brachycentrus subnubilus*, two.—W. J. Lucas.

Notes on the Season.—I was able to spend the morning of Saturday, August 7th last, one of the few really favourable collecting days in the past season, in Folkestone Warren. *Peronea aspersana* was flying among the *Poterium*; *Pyrausta anguinalis*, *Coleophora lixella*, *Lozopera dilucidana*, *L. francillana*, and other species were about. I think I saw more insects on this particular morning than I had seen during a whole fortnight spent in Lincolnshire in the middle of July, when the only interesting Lepidoptera noticed were *Tapinostola elymi*, at Mablethorpe, and a few *Scoparia ulmella*, near Willoughby.—F. G. Whittle; 7, Marine Avenue, Southend, October 9th.

Abundance of Vanessa io.—In July, along the roads around Sidmouth, the larvæ of this insect were abundant on the nettles. I could have taken hundreds.—A. H. G. Nethercot.

ENNOMOS AUTUMNARIA AT RAMSGATE.—Seeing that this insect is far from common in a wild state in Britain, I thought it would be interesting to note that ten specimens have been taken at light between September 23rd and October 2nd. — N. C. E. MILLER; 66, Ellington Road, Ramsgate.

ACRONYCTA ALNI AND CIRRHŒDIA XERAMPELINA NEAR SHREWSBURY.—I have to record the occurrence, in the middle of August last, of two larvæ of *Acronycta alni*, one found by myself in my garden at Meole Brace, the other by Mr. H. E. Forrest at Bayston Hill, about a mile distant, in both instances feeding on roses. Also at light, on the evening of September 5th, a fine but rather pale variety of *C. xerampelina*. Both species are mentioned in Mr. Newnham's Catalogue of Church Stretton Lepidoptera, but, so far as I can gather, neither have been yet noticed so near the town of Shrewsbury. I may add that both larvæ of *A. alni* pupated healthily a few days after they were found.—J. COSMO MELVILL; Meole Brace Hall, Shrewsbury, October 15th, 1909.

ABRAXAS GROSSULARIATA AB. LACTICOLOR.—A female specimen of this insect was taken on July 30th of this year by S. Carlier in Gladstone Road, Dorridge, being the third specimen recorded for Warwickshire in 1909.—E. WACE CARLIER.

PHRYXUS (DEILEPHILA) LIVORNICA AT BLACKPOOL.—A very fine specimen of *Deilephila livornica* was brought me yesterday by a friend of mine; it was taken by a man who was playing bowls at the No. 3 Hotel, Blackpool, who picked it up on the green there, and it was alive when it reached me in a tumbler tied over with paper.—T. H. SHEPHERD; 17, Slope View, Carr Lane, Shipley, Yorks, Oct. 19th.

SUGAR A FAILURE, JUNE AND JULY. — My experience has been somewhat similar to that of Mr. Jones (*antea*, p. 259), with perhaps the exception of June. In that month, up to the 21st, I found moths came freely to sugar. At the same time some of the oak and ash trees were absolutely bare of leaves. The first half of July I spent at Sidmouth, but neither on the hills nor in the woods a few miles inland would sugar attract. On my return home the same fate befell me, and it was not until August 27th that I took any moths at sugar; even then they were quite common sorts and few in numbers, although on August 10th moths were attracted to light in profusion, and a large quantity were boxed off the window fronts. Since the middle of September the weather has been so bad that collecting had to be abandoned. I do not think the reason suggested is the correct one, inasmuch as the flowers at Sidmouth and Swindon have not been so abundant as in other years, when better luck attended one's efforts. I may mention, too, that at Harpford Woods, where in 1908 *Argynnis paphia*, *Melanargia galatea*, *Epinephele ianira*, *E. tithonus*, *Aphantopus hyperanthus*, *Adopœa linea*, and *Augiades comma* swarmed, I only saw during this summer one *Pararge egeria* and a few *E. ianira*. —A. H. G. NETHERCOT; Woodland Leigh, Spring Gardens, Swindon, October 15th, 1909.

NOTES FROM INVERNESS-SHIRE, 1909. — During the month of August collecting was carried on at Onich in the above county, and

as this district appears to have been very little investigated from the entomological point of view the following notes may be of interest:—

In the way of captures the most noteworthy species were: *P. interrogationis*, *N. castanea*, *N. glareosa*, *E. lutulenta* (a melanic form), and *S. anomala*. *N. ditrapezium*, taken at light, adds another Scottish locality for this species. In addition to the common and widely occurring Geometers, the following were taken: *D. obfuscaria*, *L. salicata*, *Eup. expallidata*, *E. castigata*, *E. nanata*, and *E. centaureata* (*oblongata*). As *Vanessa atalanta* was so abundant last autumn in the southern counties, it may be recorded that this butterfly was also common in the north this year, every nettle-bed examined furnishing the larva of this species and of *V. urticæ* in profusion. Special attention was paid to the bog-myrtle, which grows abundantly in all the marshy hollows in the moorland districts about Onich. The first point noted was that the larva of *Hadena pisi* prefers this plant to broom. The latter also grows luxuriantly on the drier parts of the moors, but no *H. pisi* larvæ were ever seen or beaten from it; they were quite common on *Myrica* on which they fed freely in confinement in preference to broom supplied at the same time. The larva of *A. menyanthidis* occurred also commonly, and a number fed upon *Myrica* have now pupated in the breeding-cage. The larva of *M. hastata* occurred sparingly, and generally ichneumoned. On the same plant the larva of *P. lipsiana* was abundant, but the majority were ichneumoned, and a small percentage only emerged as imagos in September and October. The food-plant of this species is generally stated to be *Vaccinium*. With respect to Tortrices the occurrence of *G. nigromaculana* may be recorded, and the list of food-plants of *P. sponsana* extended. Although birch, oak, hornbeam, and mountain ash have been mentioned, the last-named species of *Peronea* is generally stated to feed upon beech, but pupæ found between the spun-up leaves of sallow and of sycamore also yielded this moth. The leaves of one particular sycamore tree were quite riddled by these larvæ, a large percentage of which proved to be ichneumoned.—R. Meldola; 6, Brunswick Square, October 12th, 1909.

Huntingdonshire Dragonflies, 1909.—My visits to Huntingdonshire this summer afforded very few opportunities for collecting, in consequence of the persistence of dull and rainy weather. I was fortunate enough, however, to make acquaintance with *Libellula fulva* as a living insect. This was the only Anisopterid species met with, and a few specimens were seen, including a pair *in cop.*, flying over the River Ouse at Hartford; but they were extremely active, and two or three days were consumed in their pursuit before a specimen could be secured (July 2nd). It was a fully matured male, having the abdomen wholly blue; the eyes were slaty-blue above, with a greenish tinge below. The only previous record which I can find of the occurrence of this species in the county is that given in Stephens's 'Ill. Brit. Ent.' (VI. Mand. p. 93, 1836), where *L. bimaculata* (= *L. fulva*) is stated to have been "taken in the neighbourhood of Whittlesea Mere in June." A few pairs of *Lestes dryas* were again obtained from ditches near Ramsey (June 28th), but they were in an immature state. The pterostigmata, which in the adults are blackish,

were in the earliest stages yellowish, and none of the males had developed the pruinose condition proper to the sex. The eyes of fully matured males are remarkable for their exquisite blue coloration, but the eyes of the examples taken this year were, alike in both sexes, chestnut-brown. *L. sponsa* was apparently not yet on the wing. The following Agrionids were also collected (June 23rd to July 2nd):—*Calopteryx splendens* (in fine condition and unusually common, Hartford); *Erythromma naias* (one female, Hartford); *Ischnura elegans* (abundant, Hartford and Ramsey) with its female forms *rufescens* and *infuscans*; *Agrion puella* (not common, Hartford and Ramsey); and *A. pulchellum* (common, Hartford and Ramsey). A female of *C. splendens* (July 2nd) was exceptionally large, measuring 47 mm. in length and 69 mm. in alar expanse.—F. W. Campion; 33, Maude Terrace, Walthamstow, October 2nd, 1909.

Lepidoptera from the Isle of Anglesey.—I understand that very little is known of the Lepidoptera of Anglesey, and hope that the following notes on collecting done on the north side of the island during the months of April, August, and September may be of interest.

Taking the butterflies first, it may be noted that *P. brassicæ* and *P. napi* are common everywhere, while *P. rapæ* is not so frequently found. Specimens of *E. cardamines* and *C. edusa* have been seen, and some seasons *P. cardui* and *P. atalanta* are common. *V. urticæ* is always abundant, while *V. io* is only occasionally taken. The Fritillaries are represented so far by single specimens of *A. paphia*, *A. aglaia*, and *A. adippe*. On the moors and heaths *S. semele* is abundant, while *P. megæra*, *E. janira*, *E. tithonus*, and *C. pamphilus* are to be found everywhere. *C. phlæas*, *L. astrarche*, *L. icarus*, and *A. sylvanus* are also obtained. The sallows, birches, and alders growing on the heaths are very productive of larvæ, the following being found in greater or lesser abundance: *S. populi*, *S. ocellatus*, *C. furcula*, *D. vinula*, *P. dictæoides*, *N. ziczac*, *N. dromedarius*, *L. camelina*, *N. cucullatella*, *A. leporina*, *S. libatrix*, and *A. betularia* (no example of var. *doubledayaria* has yet been obtained); also *M. rubi*, *M. pisi*, and *A. myrtilli* on the heather; *D. capsincola* feeding on the seed-heads of *Lychnis*; *C. glaucata*, *B. bimaculata* (rare), and *B. temerata* (common), on hawthorn. (It may here be mentioned that a curious variety of *L. camelina* emerged on March 29th, 1908, the right wings being of a pale buff colour, while those on the left are the typical reddish brown.) On hazel the larvæ of *P. bucephala* are found in large numbers, while those of *D. coryli*, on the same tree, are of rare occurrence. Larvæ of *D. pudibunda*, *P. similis*, *M. neustria*, *A. psi*, and *A. rumicis* have also been obtained. In the spring the sallow catkins are a great attraction to *P. rubricosa*, *T. gothica*, *T. stabilis*, *T. incerta*, *T. pulverulenta*, *T. munda* (not very common), *T. gracilis*, *X. areola* (a curious chalky-white form), together with *O. vaccinii*, *E. satellitia*, *X. socia* (one specimen), *C. vetusta*, and *C. exoleta*. At the same time of year searching low plants at night produces larvæ of *N. triangulum*, *N. baia*, *N. primulæ*, *N. rubi*, *N. xanthographa*, *T. comes*, *T. pronuba*, *T. fimbria*, *E. lichenea* (feeding on stonecrop on the sand-hills), and

B. lichenaria (on lichens growing on apple-trees). Later in the year numerous moths come to "sugar," and besides those already mentioned as larvæ are *H. derasa*, *T. batis*, *A. segetum*, *A. exclamationis*, *A. ypsilon*, *N. glareosa*, *N. depuncta* (a single specimen), *N. c-nigrum*, *N. brunnea*, *N. plecta*, *T. ianthina*, *E. prasina* (four examples only), *E. occulta* (one specimen), *E. nebulosa*, *B. brassicæ*, *M. oleracea*, *C. graminis*, *C. matura*, *M. strigilis*, *M. literosa*, *M. bicoloria* (rather scarce), *X. lithoxylea*, *X. monoglypha* (ab. *perfusca*, one example), *A. lutulenta*, *P. chi*, *P. meticulosa*, *M. maura*, *N. typica*, *L. pallens* (reddish form), *L. impura*, *L. lithargyria*, *L. conigera*, *C. quadripunctata*, *M. tragopogonis*, and *X. circellaris*. Flowers are also very attractive—lavender to *A. triplasia*, *H. sylvina*, &c.; sage to *N. umbrosa* and *C. taraxaci*; while ragwort produces plenty of *T. interjecta*, *H. nictitans*, *H. micacea*, &c. A strong acetylene light and a sheet have been the means of obtaining *D. falcataria*, *C. glaucata*, *S. lubricipeda*, *S. menthrastri*, *L. lurideola*, *A. agathina* (one specimen), *E. popularis*, *T. cespitis*, *L. testacea*, *S. anomala*, *C. xerampelina*, *A. luinosa*, *A. lychnidis*, *X. fulvago*, *X. flavago*, *P. chrysitis*, *P. gamma*, *H. proboscidalis*, *P. pruinata*, *G. papilionaria*, *H. strigata*, *A. aversata*, *A. bisetata*, *O. limitata*, *C. brumata*, *T. dubitata*, *L. prunata*, *L. testata*, *C. truncata*, *C. siterata*, *C. miata*, *L. suffumata*, *C. ferrugata*, *A. viridaria*, *M. didymata*, *X. montanata*, *X. fluctuata*, *X. sociata*, *P. alchemillata*, *C. bilineata*, *H. furcata*, *A. badiata*, *E. vulgata*, *E. rectangulata*, *A. sylvata*, *A. grossulariata*, *L. marginata*, *L. adustata*, *C. pusaria*, *M. margaritaria*, *E. alniaria*, *S. bilunaria*, *C. bidentata*, *C. elinguaria*, *O. sambucaria*, *O. luteolata*, *E. apiciaria*, *H. marginaria*, *A. æscularia*, *B. gemmaria*, *B. repandata*, and one example of *H. fusconebulosa* ab. *gallicus*; also, on the sand-hills, *P. dictæa*, *A. vestigialis*, *A. cursoria*, *A. tritici*, *A. strigula*, *A. præcox*, *E. lichenea*, *T. fulva*, *G. obscurata*, and *X. galiata*. The following moths have been taken on the wing:—*M. stellatarum*, *C. potatoria* (one specimen on the sand-hills), *O. quadra* (one example; one larva has also been found), *P. interrogationis* (one example on heath), *H. humuli*, and *H. lupulina*. In April the pupæ of *M. thalassina* are abundant under moss on rocks and stone walls, and in August the tall marsh thistles contain the pupæ of *O. ochracea*.

On the whole it may be said that Anglesey is fairly productive of Lepidoptera, much, however, depending on the season.—E. S. A. Baynes; 120, Warwick Street, S.W.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 6th*, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. Hugh Scott, B.A., Trinity College, and the Museum of Zoology, Cambridge, and Mr. Carlton C. Goudey, B.Sc., Uganda, British East Africa, were elected Fellows of the Society.—Sir George Hampson brought for exhibition the unique example of a Noctuid moth new to science, captured in the neighbourhood of Aberdeen by Mr. L. G. Esson, and presented to the National Collection by the Hon. N. C. Rothschild. It would be necessary, he said, to constitute a new genus for it, as it presented characters not known to exist in allied

species.—Mr. A. H. Jones exhibited examples of *Melitæa deione*, from La Grave, and aberrant forms of *M. didyma*, from Digne, taken in July last. This is the first record of the former species occurring so far north in the French Alps, and it is noteworthy that the specimens showed a nearer affinity to the meridional form than to the var. *berisalensis* of the Rhone Valley in Switzerland.—Mr. G. C. Dudgeon sent for exhibition a case containing examples of new and little-known butterflies from West Africa, together with notes and descriptions.—Professor T. Hudson Beare exhibited specimens of the very local and rare *Trechus rivularis*, Gyll., taken at Wicken Fen on September 15th, 1909; also of *Pseudopsis sulcata*, New., taken at Sandown, Isle of Wight, in haystack refuse, in August last. This genus and species were originally described by Newman on specimens taken in the Isle of Wight. The species has never been taken in the island since that date until the present capture.—Mr. H. St. J. Donisthorpe showed examples of the following:—(*a*) *Tychius polylineatus*, Germ., taken at Ditchling by Mr. Dollman and himself on September 9th; (*b*) *Trechus rivularis*, Gyll., taken as above; the rare Dipteron (*c*) *Meigenia floralis*, Fall.; also (*d*) *Phytodecta pallida*, bred from larvæ taken at Chilworth in July last, with the pupa-case on the larval-skin of the beetle; and the following Braconidæ (*e*) *Euphorus bistigmaticus*, Morley, n. s. male type bred from *F. rufa* nest from Weybridge, June 15th, 1909; females taken hovering over *F. rufa* nests at Weybridge, July 7th, and Beaulieu Forest, July 21st, all of this year. (*f*) *Spilomma falconivibrans*, Morley, n. g. et s. male and female bred from *F. fusca* nest from Porlock, July 29th, 1907; and (*g*) *Pachylomma buccata* female taken at St. Helen's, Isle of Wight, hovering over nests of *Lasius niger*.—Mr. W. J. Lucas showed a male and female example of *Ascalaphus coccajus*, and a pair of the same insect near the var. *leucocilius*, with the golden yellow markings replaced by white. They were taken by the Rev. F. D. Morice, with other specimens, in June of this year, at Geneva.—Mr. G. Bethune-Baker showed a series of *Chrysophanus dorcas*, which occurs in North America from Labrador, and Alaska down to Michigan, in marshy localities, and pointed out the peculiar characteristic of the egg, which is more Thecloid than Chrysophanid. He also exhibited a finely radiated example of *Chrysophanus hypophlæas*; also a North American species.—Mr. G. F. Leigh exhibited the female parent and twenty-one specimens of the offspring of *Charaxes zoolina neanthes*. This result was obtained from ova deposited by the *zoolina* form of the female, and produced four males and two females like the parent, and fifteen males and nine females of the *neanthes* form. Last year the same result was obtained in a smaller degree, but the eggs on that occasion were obtained from the *neanthes* form of the female. Mr. Leigh remarked that although the *zoolina* forms are consistent in both the wet and dry season, there are two quite distinct forms of the *neanthes* variety.—Mr. H. Eltringham, M.A., F.Z.S., read a paper on "Edibility Experiments with Larvæ and Lizards."—Mr. F. Enock, F.L.S., read a paper on "New British Mymaridæ," and illustrated his remarks with a number of lantern-slides of both sexes of the species discovered and described by him. The following papers were also communicated:—"On the

Characters and Relationships of the less-known groups of Lamellicorn Coleoptera, with Descriptions of new species of Hybosorinæ, &c.," by Gilbert J. Arrow. "A list of Chrysids taken by the writer in two visits to Jaffa, Jerusalem, and Jericho, with descriptions of new species," by the Rev. F. D. Morice, M.A. "A Revision of the African Species of the genus *Lycænesthes*," by G. T. Bethune-Baker, F.L.S.—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society.—*September* 23*rd*, 1909.—Mr. Alfred Sich, F.E.S., President, in the chair.—Mr. Tonge exhibited stereographs of the ova of *Nonagria edelsteni* and of *Celastrina argiolus*.—Mr. H. Moore, several species of the genus *Heliconius* belonging to the *Melinæa*-like group.—Mr. Newman, series of *Dianthœcia conspersa* with black forms from Shetland, *D. carpophaga* with white forms from Eastbourne, *Dicranura bicuspis* from Tilgate, *Cucullia gnaphalii* from East Kent, *Cidaria reticulata* from Windermere, *Ægeria andrenæformis* from North Kent, &c.—Mr. Barrett, imagines from a species of processionary caterpillar which occurs commonly on the pine-trees of Sicily, and a number of species of Lepidoptera found in his garden at Brockley.—Mr. Prall, dwarf specimens of *Agriades bellargus* and *Polyommatus icarus*, with unusually large examples of *Vanessa atalanta* and *Celastrina argiolus*.—Mr. Joy, a series of *Cyclopides palæmon* bred from ova, Lincolnshire.—Mr. Brown, a curiously banded form of *Cymatophora fluctuosa*.—Mr. Carr, examples of *C. fluctuosa* and *C. duplaris*, and a series of *Boarmia repandata* with var. *conversaria*, from the Wye Valley.—Mr. Cowham, a white specimen of *Rumia cratægata*.—Mr. A. Sich, a pair of the rare *Coleophora chaleogrammella* taken at Richmond on August 14th, 1909.—Mr. Turner read a paper on "Our Authorities," and exhibited a number of volumes referred to, published in the first half of the nineteenth century.—Hy. J. Turner, *Hon. Rep. Sec.*

OBITUARY.

Henry William Barker, who for some years had resided at 171, Gordon Road, Peckham, died of pleurisy after about a week's illness on the 21st September last at the comparatively early age of forty-nine years, leaving a widow and two daughters surviving.

From 1886 to 1893 Mr. Barker occupied the position of Hon. Secretary of the South London Entomological and Natural History Society. During this somewhat critical period of the Society's existence he proved himself of the greatest assistance, and when he retired from that office in March, 1893, owing to pressure of business, he was the recipient of a written testimonial of thanks from practically every member of the Society.

In the year 1887 he became a Fellow of the Entomological Society.

He was a good type of the hard-working field Naturalist, and got together a nice collection of British Macro-Lepidoptera, mostly taken or bred by himself, and which we understand is destined for "Stevens" at an early date.

T. W. H.

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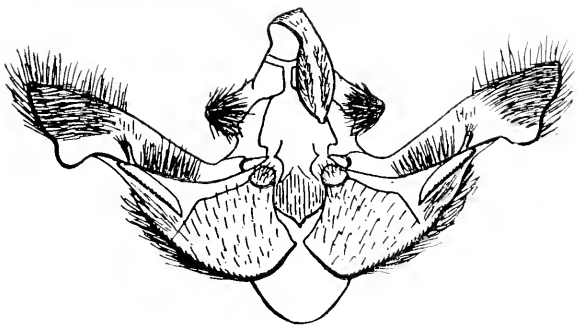

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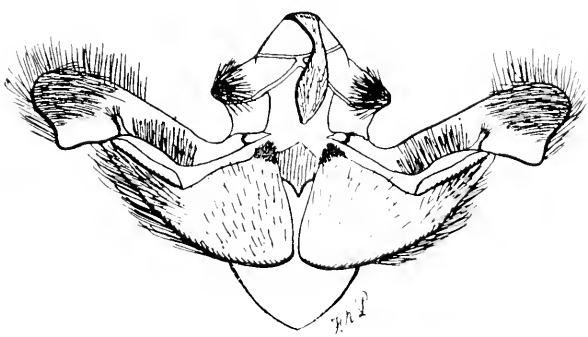

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LUPERINA NICKERLII and L. GUENEEI BAXTERI.

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LUPERINA GUENEEI, DBL., AND VAR. *BAXTERI*, VAR. NOV.

BY RICHARD SOUTH.

(PLATE VII).

THE original description of *gueneei* as published in the 'Entomologists' Annual' for 1864, p. 123:—

"LUPERINA GUENEEI, H. Dbl., n. sp.

"Alis pallide testaceis albo nigroque irroratis, strigis duabus ex lunulis confertis nigris, pallide extus adnotis, compositis; ciliis maculatis.

"Expansio alarum 1 unc. 5 lin.

"Thorax pale griseous, mixed with white. Abdomen very pale. Anterior wings pale testaceous, irrorated with black and white atoms—an indistinct interrupted pale striga before the middle—then a second arcuated striga composed of black lunules, edged externally with whitish; the first striga terminates in a rather conspicuous black dot on the inner margin of the wing, the ordinary stigmata are placed between these strigæ, the reniform one being distinctly edged with white. Between the black dots on the inner margin of the wing and the thorax is a slender black line. Hinder margin pale testaceous, with an indistinct undulating pale line, commencing at a pale patch on the costa near the apex. A distinct row of black marginal lunules, cilia spotted with deep and pale fuscous. On the costa near the apex are two oblique white spots. Posterior wings pure white in both sexes, with black marginal lunules. Antennæ of the male rather strongly ciliated."

The late Mr. J. B. Hodgkinson, in a note on *Luperina gueneei*, published in the 'Entomologist' for 1885 (xviii. 54), wrote:—

"In 1860 or 1861, T. Porter (still living) brought me two fine specimens of a moth I did not know. They were of both sexes. I purchased them from him, and sent them on to the Rev. H. Burney, who forwarded them to Henry Doubleday. From him they went to Guenée, and he returned them with the remark that he had a specimen in his collection marked as a variety of *L. testacea*, but he was quite satisfied they represented a good species when he saw both sexes. H. Doubleday then named them after Guenée, as the latter was evidently the original captor. I saw Porter again, and he told me another man, by name H. Stephenson, had one. They took three in all near the ferry at Rhyl, North Wales. I sent Porter again, and went myself, but we failed to find more afterwards. I bought the specimen from Stephenson, and sent it to Miss Sulivan, of Fulham, where, I suppose, it remains. I think it was a female."

Barrett (Brit. Lep. iv. p. 335), in referring to the three North Wales specimens, states that they "were raked from overhanging edges of sandhills."

The foregoing then appears to be all that was definitely known of the British history of *gueneei* up to 1889, in which year Mr. Baxter sent me a specimen which, as already adverted to (*antea*, p. 269), I then thought was a link connecting *gueneei* with *nickerlii*. It was this specimen, Mr. Baxter informs me, that Mr. Tutt described as *Luperina testacea* var. *incerta*, and not the 1891 example. In my remarks on the specimen (Entom. xxii. p. 271) the ground colour was noted as being pale grey. Tutt (Brit. Noct. i. p. 140) describes the ground colour of the fore wings of *incerta* as "greyish fuscous, with a slight ochreous tinge." At the present time the 1889 and the 1891 specimens are both distinctly tinged with ochreous. These two specimens, however, are referable to *L. gueneei*, Doubleday,* a female type of which is in the National Collection at South Kensington. I may add that Sir George Hampson concurs in this identification. The specimens obtained this year are of a rather different form; therefore, as it is largely due to Mr. Baxter's patient investigation that the *Luperina* muddle of twenty years' standing has been cleared up, I propose that this form be known as :—

Var. *baxteri* (Pl. VII., figs. 3 ♂, 4 ♀). — Ground colour paler, and without the ochreous tinge of *gueneei*. The black edging of the whitish transverse lines varies in intensity, but in two of the six specimens this is inconspicuous; the reniform stigma is more or less outlined in white, but this character is less evident than in

* This was from the Burney collection; a co-type was acquired by the late Mr. P. B. Mason from the same collection, and this subsequently passed into the possession of Mr. E. R. Bankes when Mason's collection was dispersed in 1905.

L. nickerlii. The fringes are pale, chequered with dark grey, their tips sometimes dotted with blackish. In two females a blackish bar extends from the claviform stigma to the post-medial line, and in these specimens the area beyond the white submarginal line is pale, almost whitish. White dots on the costa between the post-medial line and the apex are present in some of the specimens. Expanse, ♂ 32–34 millim.; ♀ 36–38 millim.

The following is an abstract from Mr. Baxter's note sent with the insects referred to above :—

"In 1891 I captured a second specimen of the *Luperina* thought to be a form of *nickerlii*, but from that time until the present year I had not been lucky enough to see any others. This was chiefly, perhaps, because I had not been working in the right kind of place. This year a friend of mine and brother collector, Mr. W. Yates, while out with me one evening, came across a *Luperina* which, on his showing it to me, I at once recognized to be the same species as my two previous captures. Since then I have taken six, and I believe Mr. Yates has taken five or six more. Some entomologists who saw the first specimen seemed to think that it was an immigrant, but this year's experience completely disposes of this, as I found one evidently just emerged, as it had a small piece of the pupa-case adhering to it, and on another occasion I found one drying its wings. Mr. Yates also found one drying its wings. I also found a crippled female which was certainly incapable of flying from the Continent; all which conclusively proves, I think, that the insect is British. The moths were not found all on one spot, but nearly two miles apart.

"All that Mr. Yates and I have found are similar in character to the 1889 one, and although they vary slightly in the depth of colouring, all are bright silvery grey, with very little trace of ochreous, except one, a rather worn male, which I have sent to Mr. Pierce, of Liverpool, who has kindly undertaken to examine the genitalia; this one was slightly more ochreous than any of the others. At the first glance the specimen might almost be taken for the light grey form of *Agrotis ripæ*. This *Luperina* is decidedly a coast insect, and I have only seen one *L. testacea* where it is found."—T. Baxter; Min-y-don, St. Anne's-on-the-Sea, Lancs.

In addition to the ochreous specimen mentioned in his note, Mr. Baxter forwarded a second example to Mr. Pierce, whose report thereon is appended:—

"I have examined nine specimens of *Luperina testacea*, all of which are exactly similar, and two specimens of a new species which agree *inter se*, but differ from *testacea* in five very distinct points as follows :—

Testacea (Pl. VII., fig. 6).	New Species (Pl. VII., fig. 5).
Harpe angulated, without corona, apex *rounded*.	Harpe angulated, without corona, apex *bluntly pointed*.
Clavus angulated to a point, *densely clothed with short hairs*.	Clavus roughly rounded, smooth, with a *few scattered hairs*.
Uncus cygnated.	Uncus cygnated, *larger than testacea*.
Ædœagus scobinated, with *four rows of teeth* at the junction of the vesica, these narrow to two rows along the vesica, then extend in a double line towards the opening.	Ædœagus scobinated, with a *double line* of teeth rising from the junction of the vesica towards its opening.
Vesica with a number of *small* cornuti.	Vesica with a number of cornuti *larger* than *testacea*.

"I have therefore no hesitation in pronouncing these light specimens to be absolutely distinct, and apparently constant. Whether they are identical with the *Luperina nickerlii* of Freyer or not I am at present unable to say, as I have so far failed to obtain specimens of this species for examination." — F. N. Pierce.

Since the above report was communicated, Mr. Pierce has obtained a pair of *nickerlii* from Messrs. Watkins and Doncaster. I also sent him a male specimen from Bohemia that I received, together with an example of the female, from Hermann Rolle, of Berlin. I, too, have a male specimen through the same source as Mr. Pierce.

Examination of the genitalia is not yet complete, but so far as it has gone Mr. Pierce has decided that *nickerlii* is not the same species as the Lancashire *Luperina*, and he is further of opinion that *nickerlii*, as represented by the specimens he has, may prove to be a form of *L. testacea*. *L. gueneei* then will stand as a distinct species, and the status of *nickerlii* must await the result of further examination. In the meantime I present, on Plate VII., figures of two of the *nickerlii* that I have. Fig. 2 represents a male which was in an old collection in Vienna, and was originally taken by Herr Nickerl, in the neighbourhood of Prague, about fifty years ago. Fig. 1 shows a female specimen from Bohemia. The ground colour of all the specimens is brownish grey suffused with deeper brown; this suffusion is deeper in the male figured than in the female. The male sent to Mr. Pierce agrees in colour with the female figured.

Concerning the distribution of *nickerlii* very little is known; it has been recorded from Germany and South France, but its home seems to be in Bohemia. *L. gueneei* appears to be almost exclusively British.

NATURAL ORDERS OF INSECTS.

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

Those who are interested in any group of insects coming within the Neuroptera (*sensu lato*) will welcome Dr. Sharp's pronouncement in last month's 'Entomologist' on an arrangement of the Natural Order of Insects that falls in line with present-day opinions. At first sight the list seems somewhat revolutionary. A second glance, however, shews that the changes from the well-known nine are really slight. They are mainly two: (1) Breaking up the old Neuroptera into the parts, which everyone who has had to do with them has always recognised, and which many have long been accustomed to consider distinct orders. (2) Placing together and giving ordinate rank to three groups of apparently degenerate, but at any rate distinct, insects, about which perhaps further may be learned in the future. The old Aptera comprising the first three orders in the new list differ so much from one another that probably if they had their due they should be still further sub-divided; but their numbers are so few that in practice this is unnecessary. For the orders containing normally winged insects it seems well to adopt names ending in *-ptera* if possible; perhaps it might be wise to do the reverse with the rest. This could be done with very little change in nomenclature, except in the case of the Siphonaptera and Odonata.

THE DRAGONFLIES OF EPPING FOREST IN 1909.

By F. W. & H. Campion.

Notwithstanding the deplorable weather, we collected during the past season as many as fifteen species of Odonata in the Epping Forest district; none of these, however, were new to our local list. It will be noticed from the following remarks on the species observed that exceptionally late dates were recorded for *Pyrrhosoma nymphula* (August 15th), *Agrion puella* (September 12th), *Cordulia ænea* (August 4th), *Erythromma naias* (August 4th), and *Anax imperator* (August 15th).

(1) *Pyrrhosoma nymphula*.—Immature specimens were met with plentifully on May 9th, at which time females preponderated greatly over males. By May 23rd pairs were flying in couple and ovipositing. Teneral individuals occurred as late in the season as June 13th, and the species continued in flight until Aug. 15th at all events, on which date an aged male was taken. This is the latest date for *P. nymphula* within our experience, although we have previously taken it in August (August 1st, 1904). The form of the female named *fulvipes* was taken on May 9th, 16th,

and 30th, and August 8th. The last-named specimen was very small, as it attained no more than 32·5 mm. in length and no more than 43·5 mm. in expanse.

(2) *Agrion puella* was not met with until May 23rd, when some mature males were taken. The period occupied by the emergence of the various individuals was an unusually protracted one, swarms of immature examples occurring at some of the ponds as late as May 30th, and the species was still emerging on July 4th. On July 18th quite a remarkable series of melanic males was obtained from one small pond; the additional black spots were mostly irregular in shape and position, and the different specimens varied in the amount of melanism exhibited. A male was taken in another part of the Forest with the moth *Tortrix viridana* in its clutches: we made an identical observation on June 28th, 1908. Again on July 18th a female had her abdomen thickly encrusted with mud, and it was inferred that she had been ovipositing in wet clay. On August 29th a female was obtained with the green ground-colour becoming blue; the blue was strongly marked at the wing-bases and on segments 1 and 2. Females with cuneiform green or blue spots on segments 3 to 6 were taken on May 23rd, July 4th and 18th, and August 22nd. A solitary male, in fine condition, was obtained as late as September 12th: this date is eleven days later than our previous latest date for the species (September 1st, 1903).

(3) *Ischnura elegans*.—When the species was first met with (May 23rd), it was already in mature condition, but an immature male occurred as late as August 4th. The female form called *rufescens* was taken on July 4th, and the form distinguished as *infuscans* on July 4th and September 5th. The female having segment 8 coloured as in *infuscans*, but having the humeral stripes on the thorax obsolete, was obtained on August 4th.

(4) *Cordulia ænea*.—The earliest capture was made on May 23rd, when the specimens come across showed a strong disposition to fly about the tree-tops. The species remained on the wing an unusually long time, and males were taken on July 18th, and another was observed in flight as late as August 4th. Females were, as usual, seldom seen, and only one capture could be effected (June 13th). The total length of this example was 48·5 mm., and the alar expanse 68·5 mm.

(5) *Libellula depressa*.—The flight of this dragonfly was observed to extend from May 23rd to August 4th.

(6) *Brachytron hafniense* (= *pratense*).—An evacuated nymph-skin, referred to this species, was obtained on May 23rd. The first imago was taken on May 30th, when as many as five specimens were seen. The insect was taken again on June 13th. An examination of several fresh specimens caught during the year showed that the current description of the colours of *B. hafniense* needs amendment or amplification in these re-

spects:—♂: The following parts are apple-green, not yellow—longitudinal stripes on thorax, sides of thorax and of segment 1, wing-bases and prominences between them. ♀ (Adult): Eyes blue above and brown below; sides of thorax and of abdomen apple-green.

(7) *Erythromma naias*.—Two freshly emerged females taken on May 30th exhibited a dull-green coloration, with purple-bronze on the upper surface. The eyes of some fully adult females taken on August 4th were noted as being reddish-brown above and yellowish-green below. One specimen was very small, its length being only 34·5 mm., and its expanse only 45 mm. It is interesting to compare this female with an unusually large one netted in the same locality on June 14th, 1908 (length 38 mm., expanse 51 mm.).

(8) *Enallagma cyathigerum* was not observed until August 4th. On August 15th a blue female was obtained, as well as a male having the spot on segment 2 entirely disconnected from the circlet behind. A male caught on September 12th was discovered to have prey in its jaws, which turned out, upon examination by Mr. Charles O. Waterhouse, to be portions of a gnat (*Culex* sp.).

(9) *Anax imperator* was first seen on August 4th, and a male was taken on the 15th of the same month.

(10) *Æschna grandis*.—On August 4th a newly emerged female was found and mature specimens were seen in flight. On August 8th and 29th females were busy ovipositing.

(11) *Sympetrum striolatum*.—On August 4th, when the species was first met with, a fully-matured male was found, as well as teneral specimens. A partially consumed insect, determined by Mr. Waterhouse as the remains of a Muscid fly, was extracted from the jaws of a male taken on September 5th. The last specimens, a male and female, were taken on October 24th.

(12) *Calopteryx splendens*. — A visit was paid to the River Roding on August 15th, and a fine male of this species was secured; a female was also seen, but not taken.

(13) *Æschna cyanea* was taken for the first time on August 15th, and for the last time on September 12th.

(14) *Sympetrum sanguineum*. — Three males were obtained on August 29th. One of them was of the largest size, and another was exceptionally small, measuring only 30·5 mm. in length, and 49 mm. in expanse of hind wings. Some of the males taken this year, like others taken in previous years, show the strongly marked constriction of the abdomen, at the suture between segments 8 and 9, seen in Charpentier's figure of his *Libellula nigripes* (= *sanguineum*, Müll.).

(15) *Lestes sponsa* was found to be present in some numbers when Coopersale Common was visited on September 7th. In view of the Abbé Pierre's discovery of the gall-making habit of

L. viridis, a prolonged search was made among willows and other plants growing near the water for any similar gall-like swellings of the twigs caused by *L. sponsa*. There was, however, nothing to indicate that the remarkable habit referred to is shared by the British insect.

A. puella, *I. elegans*, *E. cyathigerum*, *Æ. grandis*, *Æ. cyanea*, *S. sanguineum*, and *L. sponsa*, were all taken for the last time on September 12th.

Larval water-mites (Hydrachnidæ) were observed upon *P. nymphula* (May 9th and 16th), *A. puella* (May 23rd and 30th, and June 13th and 20th), and *E. cyathigerum* (August 29th). In most, if not in all, of these cases the parasites were confined to the sternum of their host.

33, Maude Terrace, Walthamstow: Oct. 31st, 1909.

CURRENT NOTES, 1909.

By G. W. Kirkaldy.

1. Böving, A. G.: "Bidrag til Kundskaben om Donaciin Larvernes Naturhistorie" (Copenhagen) 1906—summary by Busck, P. E. S. Washington, xi. 73–5 (August 31, 1909). Coleoptera.
2. Fernald, H. T.: "A New Treatment for Wireworms," J. Econ. Ent. ii. 279–80 (August 16, 1901).
3. Forbes, W. T. M.: "On certain *Pieris* Caterpillars," Psyche, xvi. 69–75, figs. 1–9 (August, 1909). Lepidoptera.
4. Gerhard, W. P.: "Additional Bibliography on Flies and Mosquitos as Carriers of Disease," Ent. News. xx. 207–211 (May, 1909). Diptera.
5. Kershaw, J. C. W.: "On the Metamorphoses and Anatomy of the Reduviid Bug, *Sycanus croceovittatus*, Dohrn," A. S. E. Belg. liii. 241–9, figs. 1–11 (July 2, 1909). Hemiptera.
6. Scharff, R. F.: "On an Early Land connection between North and South America," Amer. Nat. xliii. 513–31 (September, 1909).
7. Silvestri, F.: "Sguardo allo stato attuale dell' Entomologia agraria negli Stati-Uniti del Nord America e ammaestramenti che possono derivarne per l'Agricoltura Italiana," Boll. Soc. Agr. Ital. xiv. no. 8, pp. 1–65 (April 30, 1909). [Abstract in "Hawaiian Forester and Agricult." vi. 287–336 and 279–86 (August, 1909).]
8. Sitowski, L.: "On the Inheritance of Aniline Dye," Science xxx. 308 (September, 3, 1909). Lepidoptera.
9. Van Horn, R. W.: "[Biological] Notes on some of the Eucnemidæ of the Eastern States," P. E. S. Washington, xi. 54–61, pl. iv. and textfs. 3–4 (Aug. 31, 1909). Coleoptera.

Sitowski (8) publishes a brief note on his experiments in giving wool together with an aniline dye ("Sudan III.") to the caterpillars of *Tineola biselliella*, causing their bodies to be coloured red, the adipose tissue being the most intensely stained. The pupæ and moths resulting continued to preserve the typical red colour. There was an accumulation of dye in the ovary, and the eggs were also stained.

Fernald (2) advocates tarring the seed of maize, then placing it "in a bucket containing fine dust and Paris green mixed in such proportions that the corn [maize], after being shaken up in the bucket, showed a greenish colour." The treatment is doubtless applicable to other seeds.

Silvestri (7) gives an exceedingly interesting detailed report on his observations on a tour to investigate economic entomology in the United States. A translation of the principal part has appeared in the 'Hawaiian Forester.'

Busck (1) gives a summary of Böving's researches on the life history of the Donaciidæ.

The caterpillars investigated by Forbes (3) were *daplidice*, *rapæ*, and *brassicæ*.

The other titles are self-explanatory.

SOME AUGUST BUTTERFLIES OF CANTAL AND LOZÈRE.*

By H. Rowland-Brown, M.A., F.E.S.

(Concluded from p. 269.)

Looking through my old entomological note-books, I find that when in 1901 I visited the northern parts of Lozère, in company with Mr. A. H. Jones, I scarcely did justice to the possibilities of Mende and the surrounding mountains.† On that occasion we arrived there from the Gorges of the Tarn the last week in July, and the weather was most unsettled; the two days' collecting afforded, therefore, but a very poor idea of the pro-

* Ab. *escherinus*, n. ab.—Since writing the above, and the publication of the figures at p. 267, I have discovered among the females of *P. escheri* in my collection a magnificent example taken at St. Martin-Vésubie, July, 1902, corresponding to the aberration of the male taken in Lozère. Under side: ground colour rich fawn-brown; antemarginal spots, upper wings, reduced irregularly, two only on the right, one on the left wing; lower wings, antemarginal spots, left wing, wholly obsolete; right wing, one very small near the anal angle.

† The first mention I can find of Mende as an entomological centre is to be found in a paper by M. C. Oberthür, included in the Ann. Soc. Ent. France, 41 sér. tome iv. 1864, pp. 181–194, entitled "Excursion Entomologique dans le Lozère," which gives some account of the butterflies met with, but chiefly deals with the fauna of Florac further south.

fusion of butterfly life at this particular central spot of France, which in so many respects preserves the characteristic flora and fauna of the Midi. In the earlier weeks of the summer I have no doubt that it would well repay my "palæarctic" friends who spend their holidays each year in the better-known departments of the south and south-east to investigate Lozère, and in the last nine years the lines of approach have been greatly extended. Mende, then but to be reached by the tortuous, dilatory trains of the west, is now in direct touch with the P. L. M. from la Bastide, on the Paris-Nimes line. Florac has been linked up by a new branch of the same line from St. Cécile d'Andorge, and will benefit immediately by the new clean hotels which have, I understand, superseded the unclean hostelries of a more primitive era. Recognizing, therefore, that the season was now far advanced, and anxious to maintain a decent altitude in consequence, on August 6th I took train for Mende, *en route* passing over the Garabit viaduct, once famous as possessing the longest span of any bridge in Europe. With every hour thence the landscape took on some pleasant feature of the south; the volcanic soil disappeared, and presently in its place the cuttings and little hills displayed the unmistakable limestone formation dear to the heart of the entomologist.

After the cool, unproductive green country of Cantal, the change to the limestone hillsides of Lozère was welcome indeed. For the slopes of the Causses, however barren and wind-swept the plateaux themselves, are a feast of colour and flowery luxuriance where they fall to the valleys. As I have so often observed elsewhere in the higher alpine regions of Central Europe, the most favourable haunts for butterflies are the deep inset gullies which reach as a rule from summit to foot of the escarpments, and in spring, when the snow melts, are the water-courses by which the upland levels are drained, and the torrents carried off from the mountains. On the cloudless, still August morning of the 7th the lavender was in full bloom, the air musical with the sound of myriad insects, and every spire of fragrant bloom alive with countless butterflies—the rearguard for the most part of the seasonal broods. Occasional small forests of Austrian fir have sprung up, testifying to the skill of the department which is working with such success to reafforest the dry uplands of France, while here, there, and everywhere grows a species of *Rhamnus* which serves for *Gonopteryx cleopatra* and *G. rhamni*—taken together on the 9th—one male only of the former, and a female which might have belonged to either species; the male of *rhamni* being decidedly common on this and succeeding days. *Anthyllis*, the great white *Medicago*, and innumerable *Papilionaceæ*, seldom seen upon the volcanic formation at le Lioran, all suggested Lycænid visitants, as well as the cytisus and laburnum trees, now laden with red-green pods.

Here also were the prickly blue thistles to lend a decidedly meridional touch of colour among the lavender; while the scanty hedges which divide the cultivated lucerne and sainfoin fields of the main valley of the Lot from the stony approaches to the Causse were hung with scented clematis, with a dense underwood of wild gooseberries, exuberant of thorns, but jewelled with tiny luscious gold and crimson fruits—welcome dessert to the *al fresco* luncheon in a land where no water is to be found. The butterflies about were largely composed of Satyridæ; *Satyrus alcyone* perhaps the most in evidence, but *Hipparchia semele* and *circe* running it close in point of numbers. *S. hermione* was hardly less abundant with *briseis*, chiefly males, and just coming on in full force. But for sheer beauty of colour they had no chance with *Pyrameis atalanta* and *P. cardui*, whose folded wings as they banqueted blended in perfect harmony with the delicate pearly greys and lilac shadow of the lavender.

On this well-remembered ground nothing is more curious than the extraordinary localization of species. I recall having taken *Thymelicus actæon* in 1901 at a certain corner where there was a little waste of scrub and rushes. The bushes had grown considerably, but the intervening spaces provided me with half a dozen examples or so, and precisely the same rule appeared to govern the limitations of *Polyommatus dolus*, for neither was to be taken, now or then, outside these curiously restricted areas, though by walking the whole way to Balsiège along the Causse I struck several colonies of the lovely and little-known "blue," which, taking the form var. *vittata*, Oberth., and extending from the Atlantic slope of the Lozère Mountains, seems, at Ytrac and Aurillac, in the valley of the Cère, to reach its north-western limit in France, though the discovery of the species at Aguessac (Aveyron) by M. René Oberthür's collector may continue the "life-line," so to speak, further south-west than at present suspected. The first day I was on the *dolus* ground at Balsiège—a dry torrent-bed, filled with lavender, white melilot, wild mallow, and other herbs, about half a mile towards Mende from the village—I arrived at noon, but the sky was temporarily clouded, with high wind, and it was not until four o'clock that I suddenly espied a wasted male flitting in company with some beautifully fresh *P. corydon*, ab. *aurantia*, to which, on the wing, it bears a close resemblance. Evidently I was too late by a good ten days, and of the eight or nine males selected but two have attained to "cabinet rank"! As for the females, to separate the which from *P. damon* is a standing entomological puzzle, not one could I discover. Yet one would have expected a few surviving with the last of the males, for they were flying here nine years ago in profusion. In vain I searched the scanty sainfoin patches which are its habitat. I could find only males of *P. damon*, with occasional flashes of *P. hylas*, surely one of

the most exquisite of Lycænids, if not as variable in the depth and quality of its colour as another very common Causse member of the family, *P. escheri*; *escheri*, indeed, appearing to exhaust the whole gamut of the colour tones we describe loosely as "blue." The most usual, I suppose, is the rather mazarine-tinted form of the French Alps; then there is the deep steely-blue form with dark suffused borders from the Simplon, while examples from Bosnia exhibit the silky azure familiar in our alternative form of *bellargus*. On the under side it appears to be among the most constant of the "blues," but this year at Mende, where it occurred always in great abundance—and I even netted a few females from plants of *Anthyllis*, though I never found the sexes flying together—I took one male (figured, p. 267), which in general appearance of the under side is not unlike that of the form of *C.* var. *gordius*, ab. *midas*, Lowe; the antemarginal spots have entirely disappeared; the discoidal spot is large and pronounced. We might venture to call this ab. *escherinus*, new ab., I think, though perhaps it is commoner than I suppose, for I have seen a similar aberration from Bérisal in Mr. W. G. Sheldon's collection. Another distinctive form of Lycænid in Lozère is the female *P. alexis*, which reproduces in miniature the warm, rich, uniform brown upper side and continuous orange-spotted marginal bands of the lovely and larger unnamed summer race from Ajaccio, which I should like to denominate ab. *flavocinctata*, though I fancy, so far as Corsica is concerned, accepted as a form of *P. alexis*, it will some day be differentiated from the type as a constant variety at the least.

Meanwhile a few battered *P. baton* were sharing the little patches of wild thyme with *Thecla spini* and *Epinephele lycaon*, the latter worn but still in countless profusion. Nor was *Parnassius apollo* by any means rare—a fine form—the best capture I made being a magnificent female = ab. *neradensis*, Obth., three and three-quarters of an inch from apex to apex of the extended wings, on which the normal red spots are changed to a brilliant orange-yellow. The piece of waste on which I took *nevadensis* was, indeed, an ideal hunting-ground. It is situated on the slope of the Causse, a point about midway between Mende and Balsiège, where the railway crosses the road near a lonely farm-house sort of inn, which provided me with the requisites for a sufficient *déjeuner* in a vine-clad harbour—bread and butter of the best, a cheese rather suggestive of Dorset "blue vinny," sardines, and light beer in bottles cool, and the veriest nectar for these burning August days. Above the lane the hill rises abruptly through "garrigues" (abandoned vineyards), well provided with sweet-smelling herbs and the universal lavender; and here, after eight years, I resumed acquaintance with the dainty *Zygæna sarpedon*, the rarest of its kind hereabouts, flying briskly

in the sunshine with *Z. carniolica*, *Z. fausta* var. *faustina*, *Z. hilaris*, and, more rarely, *Z. loniceræ*, *fausta* being perhaps the most active, and all in good order. Both *Colias edusa* and *C. hyale* were also plentiful, and *S. cordula*, quite fresh, showed conspicuously with their dark velvet wings on the daisies, which still supported a few *Melanargia galatea* ab. *leucomelas*, decidedly commoner than the type, though invariably too broken for the collecting-boxes. Fritillaries were few and far between: *A. adippe*, *A. aglaia*, and *A. niobe* var. *eris*; *A. selene*—one almost unrecognizable example—with *M. athalia* and *M. didyma*, were only "occasionals"; *Cœnonympha dorus* very common, but all shabby fellows, and almost vanished before the week I spent on Causse was finished. I may add that the 'Hôtel des Voyageurs' at Mende offers good accommodation (in the *dépendence*), and the abundant fruit supplies and trout from the Lot (by the banks of which charming river I found *Papilio machaon* one sunny morning in some numbers) afford the *chef* opportunities of which he is not slow to take advantage. Seven francs a day for a good room and full *pension* reminds one of the palmy days of Switzerland as we remember it thirty years ago, with an infinitely better cuisine included; and prices generally in this part of France rule decidedly low, even small tips being received with civility and gratitude.

Leaving Mende on the 14th, I passed the night at Bort (Corrèse), a small town prettily situated on another good trout-stream, the Upper Dordogne, and having a couple of hours before the Paris train left, though it was tropically hot I strolled up towards the forests which encircle the perpendicular cliffs known as the Orgues de Bort, but, with the exception of *Dryas paphia*, *Leptosia sinapis*, *Melitæa parthenie*, and abundant *E. tithonus*, I saw nothing on the wing; and next morning found me back at Paris, where the short spell of August summer was already at an end. From all accounts the weather from June onwards in France north and south was abnormally cloudy and wet, and this no doubt accounted largely for the meagre results of my collecting this year. But I think it worth remarking that at le Lioran the extraordinary flights of dragonflies in general and of *Anax imperator* in particular may have assisted to exterminate the already none too plentiful Rhopalocera. Often did I come upon a likely corner to find a couple of these fine insects in possession, and as they remained hawking over the flowers and low shrubs it appeared as though the butterflies instinctively dropped to the earth or took to covert. At all events, when *Anax* was about I had extremely poor luck with the Order of which I was in search.

Of the Mende butterflies taken or observed by me the following is a complete list:—

Hesperiidæ. — *Carcharodus alceæ; Hesperia carthami, H. alveus* var. *cirsii, Pyrgus sao, Pamphila sylvanus, P. comma, Thymelicus actæon, T. lineola, T. flavus.*

Lycænidæ.—*Chrysophanus alciphron* var. *gordius, C. phlæas; Polyommatus damon, P. dolus, P. corydon, P. bellargus, P. hylas, P. escheri, P. alexis, P. astrarche, P. baton; Rusticus argus, L.; Celastrina argiolus; Zephyrus betulæ; Thecla spini, T. ilicis, T. acaciæ* (one).

Papilionidæ.—*Papilio machaon; Parnassius apollo* and ab. *nevadensis; Aporia cratægi; Pieris brassicæ, P. rapæ, P. napi; Leptosia sinapis,* and ab. *erysimi; Colias hyale, C. edusa; Gonopteryx rhamni, G. cleopatra.*

Nymphalidæ.—*Argynnis aglaia, A. adippe, A. niobe* var. *eris; Brenthis selene, B. daphne, B. dia; Melitæa cinxia, M. didyma, M. athalia, M. dictynna; Pyrameis cardui, P. atalanta; Vanessa io; Aglais urticæ; Eugonia polychloros.*

Satyridæ.—*Pararge mæra, P. megæra; Satyrus hermione, S. alcyone, S. circe, S. actæa; Hipparchia briseis, H. semele; Epinephele jurtina, E. lycaon, E. tithonus; Cœnonympha arcania, C. dorus, C. pamphilus; Erebia neoridas; Melanargia galatea.*

Dryas paphia and *Melitæa parthenie* I did not observe after the 7th, except in the neighbourhood of Bort.

Harrow Weald: September 20th, 1909.

SIX WEEKS AMONGST HUNGARIAN BUTTERFLIES.

By W. G. Sheldon, F.E.S.

(Concluded from p. 276.)

Shortly afterwards, the storm having ceased, I proceeded towards the hotel, to which I had only gone a few yards when another example was observed on the trunk of a tree. This was rendered practically torpid by the hail, and allowed me without difficulty to scrape it into the net, the only instance in which I succeeded in effecting a capture by this method.

The first example was taken on June 19th, after which I did not see another until June 25th, on which day two were taken; after this date, until I left Herculesbad, a few were taken each day, the total amassed being fourteen fine specimens, all males, and which I suppose involved about as many hours' work. I believe *P. roxelana* is in some years quite abundant in the Kreuze wood; but it certainly was not so in 1909, and except at two spots I did not see more than three or four examples each day. At each of those exceptions grew a large oak tree, the upper parts of which were dead and preyed upon by various insects, chiefly the larvæ of Coleoptera, and no doubt it was the

frass exuding that was the attraction to butterflies; on these trees every time I passed some five or six *P. roxelana* were to be seen; but, except on one occasion when I netted two of them, they refused to come within reach, and, if disturbed by stones, flew away. I saw two examples at the top of the Coronini wood, one of which I captured. When not disturbed *P. roxelana* has a typically satyrid flight, and is much like in appearance a large *P. mæra*, which haunts the same localities at the time of its emergence: when alarmed it makes a headlong rush through the surrounding trees and undergrowth, usually straight uphill or straight downhill, and on such ground as it frequents it is quite useless to pursue it if missed at the first stroke. I did not see anything that I could consider looked at all like *Pararge climene*, and I was told by Professor Schmidt that this species, for which Herculesbad was noted, has not been seen there for the last ten years.

The handsome *Syntomis phegæa* was very abundant at Herculesbad, contrary to the usual habits of the Zygænidæ, frequenting chiefly the shade of thick woods; on one occasion I observed an unusual instance of assembling with this species, sixteen males of which were flying and crawling round a space of a few inches on a bank in a wood. On looking for the cause I found a crevice partly filled with a spider's web, and in it, in the clutches of a large spider, an unfortunate female of *S. phegæa*. Other Zygænidæ noticed here were *Zygæna filipendulæ*, *Z. trifolii*, *Z. scabiosæ*, *Z. carniolica*, and *Z. achilleæ*. A quite unexpected and gratifying sight at dusk was the quantities of fireflies which frequented the banks and woods. I captured a few of these, and found they were the male of a Coleopteron, *Luciola mingrelica*, very similar in size and general appearance to the male of our own glowworm. The light was not continuous, but as the insect flew along, at intervals of about three seconds, it had the power to cause a flash like that of an electric spark, and a very bright one, to issue from the under side of the anal segments of the abdomen. I was told that the majority of Hungarian entomologists were coleopterists, and when one sees the magnificent coleopterous fauna of that country one is not surprised; the Longicorns and rose beetles were especially grand, one species of the former, which was not uncommon, was as large as our stag beetle, and had antennæ at least three inches in length.

I left Herculesbad for Budapest *en route* for the Hohe Tatra on July 1st, Mr. Tylecote having returned to England a week previously. A rather quaint incident arose in connection with the visitor's tax. This is payable by all who stay in the Bad for more than five days; the amount, varying from 2 to 24 krones, is assessed by the local authorities on their views as to each person's means and position; the evidence on which they proceed being contained in the form which all visitors are asked to fill up

immediately on their arrival, and which includes their occupation. I filled mine in without any thought of the result, but on my fifth day found myself called upon to pay 16 krones, whilst my friend, who is fortunate enough not to have an occupation, got off for 8 krones. I strongly protested at this manifest injustice, but was met by the argument: "But you put yourself down as a 'director.'" I hastened to explain that however dignified such an occupation might be in Hungary, in England there were plenty of very poor directors; but it was of no use, I had to pay the 16 krones, and to console myself with thinking that some at least of my entomological predecessors visiting Herculesbad had paid considerably more.

The Hohe Tatra is that portion of the great chain of mountains, the Carpathians, which rises out of the plain north-east of Budapest, at a distance of some 140 miles as the crow flies; it is the highest portion of the chain, rising in some of its peaks to an altitude of nearly 9000 ft., and although not covering a large area—which I suppose may measure roughly twenty miles by ten—it contains some of the finest mountain scenery to be found in Europe. Strange to say, in spite of this and that it also contains some of the best hotels I have seen anywhere in Europe, the Tatra is very little known to British tourists, and hardly at all to those of us who are entomologists. For although I happen to know that one or two British lepidopterists have visited it, there do not seem to be any published reports in English of the insect fauna of the region; at least I have been unable to discover any, though of course it is well known to the Hungarians, and in a lesser degree to the Germans.*

It was therefore with considerable curiosity and anticipation of something interesting that I proceeded thither. Unfortunately during my stay of eleven days, from the 3rd to the 13th of July, the weather was the very worst I have ever experienced in continental Europe, and I was only able to get amongst the alpine species on two occasions; on the first I only had a few minutes' sunshine, and on the second occasion, although there was a fair amount of it, the temperature was so low I did not see a single butterfly on the wing. Eventually, after several days of almost continuous rain and mist, I had to give it up and come away.

The Tatra from the treeless plain, which has an altitude of about 2000 ft. up to about 5000 ft., is thickly covered with forests of spruce; the hotels, of which there are a number, are principally scattered about these forests at an altitude of about 3000 ft. The climate is much colder than at a corresponding level in the Alps, and the whole district reminds one forcibly of some parts of Scotland. The mountains are chiefly of a granite formation, though in the east

* *Cf.* 'Iris,' vol. xiv, p. 365, *et seq.* [H. R.-B.]

there is a limestone range. The flora is a most interesting one, including many species familiar in the garden at home, especially of the *Campanula* group, whilst the great stretches of *Spiræa aruncus* in the forest glades are among the finest natural floral effects I have seen. The cold climate and abundant rainfall is accountable no doubt for the rather scanty insect fauna, as compared with other parts of Hungary; and the specimens, though many of them are very interesting, have a tendency to run to obscurely marked forms and small size. I speak of the sub-alpine species, for it was only amongst these that I was able to make any observations.

I arrived at the Palace Hotel, Tatra Lomnitz, about 7 a.m. on the 3rd July, after travelling all night from Budapest; the rain which had descended continuously for thirty-six hours was still in evidence, and after selecting a room and having a conversation with the manager, during which he imparted to me the cheerful intelligence that it had rained off and on for the last three weeks, I decided to get some sleep. Awaking about noon I was delighted to see that the sun was shining, and after partaking of lunch sallied forth. I may mention here that the ground immediately around the Palace Hotel, "Nagy Szàlloda," in Magyar, especially on the side nearest Tatra Fured, is the best I could find in the Tatra. Leaving the hotel I bore to the left, and found myself in a grassy ride running through the spruce forest, with seats at intervals, and plenty of flowers; here butterflies were quite abundant, the first one netted being *Erebia medusa* var. *hippomedusa*, perhaps the most abundant species met with in the Tatra, and occurring everywhere I collected. *E. ligea* var. *adyte* was not infrequent, and equally widely spread; a dark form of *Cœnonympha iphis*, with the ocelli on the under side strongly developed, flitted here and there; and around a swampy spot covered with rough tussocky grass I saw a *Cœnonympha* of slightly different flight and somewhat browner tint; netting this I was delighted to find I had run to earth a butterfly taken by but few Britishers—*C. hero*; this species, which had evidently been out some time, was widely spread on the granite, wherever swamps covered with the rush-like grass were to be found. A flight familiar, but not seen for years, was that of *Carterocephalus palæmon*, of which I came across a few specimens each day. I was surprised also to meet with *Chrysophanus hippothoë*, type, and with no approach to the mountain form var. *curybia*; the females had a fair amount of copper on the upper side, and the males well marked dark margins to the wings, and in one or two of them the inferiors are more strongly shot with purple than any specimens I have seen. Perhaps the most interesting species I took in the Tatra was a *Melitæa* with the upper side as dark as *M. dictynna*, but which has an under side very suggestive of *M. aurelia*, which the Rev. G.

Wheeler, who has seen the specimens, informs me are the *M.* var. ? *dictynnoides* of Horrnuzaki, included by Staudinger in his Catalogue as a var. of *M. aurelia*, but which Mr. Wheeler believes to be a distinct species, an opinion receiving support from very typical specimens of *M. aurelia*, taken at Tatra Lomnitz, for which I am indebted to Baron Vecsez. The dark Hungarian form of *Pararge mæra*, which somewhat resembles *P. hiera*, but is not that species, was common and in good condition; *Nomiades semiargus* was fine and typical; *Brenthis ino* was found at rest not infrequently on the raspberry bushes; *Pararge egeria* var. *egerides* flew here and there, but was going over; *Brenthis selene* was still in good order; *B. euphrosyne* plentiful but *passé*.

On July 4th I paid a visit to Count Teleki, who has a residence at Tatra Fured, and who is interested in entomology and Nature study generally. I was very kindly welcomed and hospitably treated by the Count, who knows the district thoroughly, and whom I have to thank for much useful information as to localities and species. On this day not much collecting was done, but Count Teleki proposed that we should take our nets and work a small swamp in the neighbourhood of his house for *Cœnonympha hero* until lunch was ready; only one or two of this species was met with, but I was delighted to find here the fine form of *Brenthis pales* var. *arsilache*, which was abundant and in fine order.

I was anxious to try the chalk range at the eastern end of the Tatra, where I had been informed that, amongst other species, the much-wanted *Cœnonympha leander* was to be found; accordingly on the evening of this day I took a carriage and moved on to Tatra Hohlenhaim or, as it is more usually called, Barlangliget, its Hungarian name. This locality, judging from the flora, looks a very good one, given fine weather, but the four days of my stay were almost continuously dull or rainy, and I did not see very much, and very little indeed that was new to me. The only species taken here, not found at Tatra Lomnitz, were *Lycæna arion*, a small but bright blue form, and one or two *Melitæa dictynna*, which were quite typical. The morning of July 9th broke fairly cloudless, and I made an attempt to get at the higher-ground-frequenting species, but by the time I arrived at the upper edge of the forest clouds had gathered, and with the exception of a glint of sunshine for a few minutes, during which I netted two specimens of *Brenthis pales*, collecting was hopeless for the rest of the day. This form of *B. pales* does not appear to correspond with any of the named forms very closely; the upper sides resemble var. *arsilache* in the large blotches, but the specimens are smaller than those of that form taken on the lower ground at Tatra Fured, whilst the under sides are quite distinct and resemble closely the type; I suppose they might most correctly be styled as intermediate between the type and var. *arsilache*.

On July 9th I removed my quarters to Tatra Fured, which is distant from Barlangliget about fifteen miles, and to get to which one has to go through Tatra Lomnitz. The weather during my stay at Tatra Fured was equally bad with that I had experienced elsewhere in the Tatra, and not much could be done. The day after my arrival, although there was some sun in the morning, the signs were ominous, and I could only get a few more *Brenthis pales* var. *arsilache* in the swamp where I had previously found them. Then the rain commenced to descend in torrents, and continued for the rest of the day. Professor Schmidt had told me that there was a good locality for *Parnassius apollo* var. *carpathica* between Tatra Fured and Tatra Lomnitz, about midway between the two places and on the left side of the road travelling from the former to the latter, and there being glimpses of sun on the morning of July 11th I made my way thither. After beating about on some foothills, which approach close to the road, and rise perhaps 300 ft. above it, I kicked up a pair of this magnificent form, one of which I captured; I afterwards saw some half dozen others, of which two were netted. The specimens, which are all males, expand 88 mm. as against 78 mm., which is the average of my Swiss specimens, although they are not quite so large as my largest Albarracin Sierra example, which expands 92 mm. On the same ground I came across *Polyommatus optilete*. On July 12th the weather broke up again, and the outlook was so hopeless that I felt it was no use my staying longer, and accordingly on the following morning I entrained for Vienna on my route to England.

At Tatra Fured I again came across luminous Coleoptera of two forms, one of these was the apterous female of *Phausis splendidula* which was abundant, sitting amongst the herbage on the roadsides in the forest; the whole of the abdomen of this sex, which was white in colour, was phosphorescent, and the light resembled that of our glowworm. The other form was the male of the same species, which flew slowly amongst the trees in the forest, the phosphorescent portion, which was only small, being on the under side of the abdomen; the light, which was much less than in the female, was continuous, and as the flight was steady and in a straight line it had the appearance of an electric spark running along a wire.

The species of Rhopalocera observed in the Hohe Tatra, thirty-three in number, were: *Parnassius apollo* var. *carpathica*, *Apori crataegi*, *Pieris rapæ*, *P. napi*, *Euchloë cardamines*, *Leucophasia sinapis*, *Gonepteryx rhamni*, *Melitæa dictynnoides*, *M. dictynna*, *Brenthis selene*, *B. euphrosyne*, *B. pales* and var. *arsilache*, *B. ino*, *Argynnis aglaia*, *Aglais urticæ*, *Euvanessa antiopa* (hybernated), *Pyrameis atalanta*, *Polygonia c-album*, *Erebia medusa* var. *hippomedusa*, *E. ligea* var. *adyte*, *Enodia hyperanthus*, *Pararge mæra*,

P. egeria var. *egerides*, *Cœnonympha hero*, *C. iphis*, *Chrysophanus hippothoë*, *Lycæna arion*, *Cupido minima*, *Nomiades semiargus*, *Polyommatus optilete*, *Rusticus argus* (*ægon*), *Nisoniades tages*, *Pamphila sylvanus*, and *Carterocephalus palæmon*.

The number of species of Rhopalocera observed in the Budapest district was sixty, and at Herculesbad seventy-six; the total observed in the various districts in Hungary, in which I collected, was one hundred.

Youlgreave, South Croydon: Sept. 5th, 1909.

A NEW BEE OF THE GENUS *HABROPODA* FROM ASSAM.

By T. D. A. Cockerell.

When collecting in Assam in September 1903, Mr. Rowland E. Turner obtained a very fine species of the genus *Habropoda*, which was recognized by the late Colonel Bingham as undescribed. The type, herewith described, will be placed in the collection of the British Museum.

Habropoda turneri, n. sp.

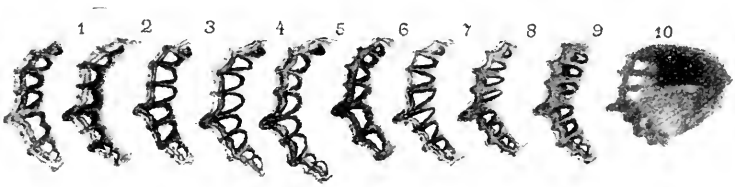
♀. Length about 17 mm., anterior wing 11; robust, but with the abdomen much longer in proportion to its breadth than in *H. zonatula*, Sm.; black, with the pubescence of the head, and thorax above as far back as the level of the hind wings, black; posterior to this, beginning abruptly, the pubescence is sulphur-yellow, and the same, very dense, covers the first two segments of the abdomen; the third segment has the hair short, dense and coal-black; the fourth and fifth have it reddish, more or less black at sides; there is a little pale tomentum at sides of face, and the lower part of the cheeks is covered with long white hair; a peculiar feature is a small patch of appressed white hair just above (a little mesad of) each antenna, surrounded on all sides by erect long black hair; the pleura is covered with long white hair; hair of legs mainly black, but some long white hair on anterior femora beneath; brush at end of hind basitarsus orange-fulvous. Clypeus prominently densely punctured, but the punctures irregular and largely in grooves; antennæ black, third joint a little longer than 4 + 5; tegulæ black; wings fuliginous, third s. m. broader than second; marginal cell long; hind tibiæ broad and flat, not produced at end, the scopa coarse and dense.

Hab. Shillong, Assam.

A very distinct species, not closely resembling any of the four (*H. montana*, Rad., *H. magrettii*, Bingh., *H. moelleri*, Bingh., *H. fulvipes*, Cam.) known from India. There is a certain general resemblance to *H. tarsata*, but that has the hair of the thorax entirely orange-fulvous above.

VARIATION IN *VANESSA URTICÆ*, L.: SEASONAL (CLIMATICAL) AND LOCAL VARIATION IN *V. URTICÆ* AND IN *V. IO*, L., BY WHICH THE TWO SPECIES SHOW A TENDENCY TO MEET IN FACIES.

By T. Reuss.



Variation in *Vanessa urticæ*, L.

The above figures represent the marginal markings on the hind wings of nine varieties—figs. 1–9—of *V. urticæ*, L., which I reared this season from wild Hertfordshire larvæ. Fig. 10 is the hind wing of an aberration I bred on the 14th of August, 1906, from wild Continental larvæ, and figured as ab. *ioprotoformis* in the Ent. Rec. pl. vii. fig. 5, last April, without at the time describing the specimen.

All the marginal markings depicted are those of female imagines, with two exceptions—figs. 1 and 9. The markings of each specimen in figs. 1–7 were otherwise, as in typical *urticæ*, and the ground colour exhibited its usual variability in different shades of brownish, reddish, and yellowish orange. Figs. 8 and 9 are only slightly aberrative in other details, but in fig. 10 the whole facies is changed.

The width of these marginal markings, as I measured them across the fourth median lunule in different specimens, varied from 2·5 mm. in ab. *pygmæa*, Rühl, measuring 18 mm. along costa of each fore wing, to a little over 4 mm. in a giant form with the fore wings each measuring 28·5 mm. from base to tip. In medium-sized specimens the margin seems to be most often just under 4 mm. broad—almost as broad therefore as in the largest forms.

All the margins here figured vary only very slightly in width, despite the differences not only in the shape and size of the lunules, but also in the size of the whole wings. In fig. 3 the large lunules narrow the outer border (which together with the costal lunules is typical in fig. 1), while in fig. 8 the border is widened and disintegrated, the original brownish suffusion becoming plainly visible, which (also in the other figures) links

up the lunules in a band. In the Corsican variety *ichnusa*, Bon., the brownish suffusion often confines itself to the parts between the fringe and the base of the lunules, leaving the black triangles round the lunules separated towards the apex by the red ground colour. The margin consequently has a very jagged outline. Occasionally it appears also in British specimens. The opposite development is shown in fig. 2 (*parvilunulata*, Rynr.).

Besides appearing in an otherwise typical facies, fig. 2, the margin associated itself with a fine brown ground colour. A specimen of this kind, which I reared in the beginning of last June from larvæ collected full-sized on May 23rd (this is perhaps an early date for full-grown larvæ of *urticæ* in England) exhibited a very dark under side, with the two median puncta of the fore wings each marked by a deep brown blotch, in the same manner as is often exhibited in the under side of another species, *V. xanthomelas*. On the upper side of the fore wings the puncta are large and conspicuous; the inner marginal blotch is, however, obsolete. I suggest for this aberration the name ab. *subtuspuncta* (female).

Fig. 3, for which the varietal name ab. *magnilunulata*, Rynr., appears appropriate, has a yellowish ground colour, and the lunules are sometimes greenish. I reared three specimens of this variety, which were all females, and I am inclined to think that this form with the broad, almost trapeze-shaped blue spots is in truth a "female variety," and perhaps the same may be said of fig. 4.

The ground colour of fig. 4 is brownish with shining light blue lunules. I have also reared this form with violet markings, and sometimes groups of white scales form conspicuous spots among the violet or blue scales of the lunules. In the ocellus of the hind wings in *V. io* occasionally white spots or streaks appear in a somewhat similar manner, and three of these spots are there so placed that they evidently form a continuation of the chain of white spots already present on the fore wings, which sometimes is made complete by an extra spot near the inner angle.

Fig. 5, female, with crescent-shaped lunules is associated with a fiery red or rich orange ground colour, and all the finest specimens I reared were females.

Fig. 6, female, has violet lunules, and only on one hind wing do the anal lunules coalesce as depicted. Fig. 1 shows a transitory form in a male; in transitory females no points protrude from the lunules, but instead they are separated by a narrow black line, the "lean to" of the lunules being quite different. Such transitory females occur sometimes with lunules shaped as in fig. 2.

In other specimens the two largest median lunules tend to coalesce, and on the fore wings, at the apex, broad square blue

spots show a similar tendency. This sort of development—very different from that in ab. *luna* (see *antea*, p. 223, fig. 1), which presents quite another aspect with its *isolated* crescent—points out the possibility that a *continuous blue band* might border the wings. I believe that such a variety (if it does not exist already?) could soon be bred by pairing some of the transitory specimens obtainable from wild larvæ. I would mention here that normal British *V. io*, male and female—as, for instance, they are figured from photographs in Mr. South's 'Butterflies of the British Isles'—have a black-blue spotted margin at the apex of the fore wings, *as in urticæ*, but that a variety may sometimes be captured in which these blue spots spread and form an *unbroken blue band* with black outer border (see figures of *V. io*, 2 and 3).

Climatical (Seasonal) and Local Variation in *Vanessa io*, L., and what it tends to.

Cold induces an urticæ-form facies; heat and contrasts in temperature (cold nights and hot days, cold winters and hot summers), on the other hand, bring *ocelliformity* near perfection, and *efface all resemblance* to *urticæ*.

Fig. 2, induced by comparatively cool seasons, is the normal form of *V. io* in the British Isles. Fig. 3, induced by hot seasons, occurs with many transitions to Fig. 2 as a variety in Britain, but is, on the Continent, the most common form in many localities, especially in the South, where *V. io* is often double-brooded, and is therefore often figured as typical in Continental butterfly books. Fig. 1 is *V. io* ab. *fischeri*, Stdfss., induced by cold (temperature experiment representing *exaggerated seasonal influence*); it exhibits the ocellus disintegrated into its constituent parts, with a complete chain of marginal lunules as in var. *ichnusa*, the local heat form of *V. urticæ*. This form, obtained under such conditions, is, however, only an *exaggerated form of Fig. 2*, which latter often exhibits traces of the median marginal lunules, and is a common form in the field wherever the summers are cool and the climate generally contrastless. Fig. 3, with the perfect banded ocellus (as in the peacock's feather) on the fore wings, seems to represent the culminating point of *ocelliform* development in *V. io*; also the hind wings show a fine blue ocellus. But this latter ocellus seems still capable of an exaggerated development, as shown in Fig. 4, induced by exposure of the pupæ to tropical warmth for three days, in which the remaining black bar is suffused with blue. This ocellus contains three small white spots, correlated, evidently, with those of the fore wings. For the latter unusual and beautiful variety (Fig. 4) I suggest the varietal name ab. *splendens*. Figs. 2, 3, and 4 were bred by me from wild Hertfordshire larvæ last July and August. Fig. 1 was bred by Prof. Standfuss by exposing the pupæ to a low temperature (*cf.* Standfuss, 'Handbook of Palæarctic Lepidoptera,' 1896). The very large local (heat) form of Sardinia. *V. io* ab. *sardoa*, Staud., exhibits *variation of the ground colour* instead of the ocelli.

The ocelli appear to be intermediate between figs. 2 and 3, the light ring round the ocellus of the hind wings darkens almost to the colour of the border (exactly as in most heat-forms bred by experiment from northern pupæ), and the dark-coloured fore wings are suffused with fulvous. Northern pupæ of *V. io*, bred in a high temperature, occasionally produce specimens even darker than ab. *sardoa*, and sometimes the ground colour is suffused with brown.

This variety exhibits a much more "peacock-like" ocellus than the normal fly, and to *breed it*, almost to the exclusion of the type, I found it usually only necessary to keep the larvæ and pupæ in a sunny, warm room, in which the windows must be kept shut against cold during the nights. On the other hand, *not one specimen* of this perfect form emerged from pupæ which I kept in a dark, sunless, comparatively cold place, though it appeared from other pupæ which I subjected to -3° C. three times during the first days of their development. "Contrasts in temperature" here take effect. In this connection I would suggest that almost all kinds of "indoor conditions," even if not purposely modified, differ so essentially from "wild" conditions, that their influence may be considered sufficiently abnormal to help in accounting for the fact that apparently the imagines reared in captivity are oftener given to variation than in open nature.

Fig. 7, female, has violet lunules curved and pointed like teeth, but I have also reared specimens with blue and whitish "teeth." These imagines were of both sexes, and several other forms intermediate between figs. 7 and 8 were all males with only one exception. It seems that very large lunules appear much more easily in the female than in the male, especially on the hind wings; but generally the extent of variation in the size, shape, and position of the lunules is in both sexes as remarkable as is also the variation in the colour of these markings. Grey, yellow, metallic white, green-blue, blue or violet in many shades—all these tints have appeared in the margin of *urticæ*, and, apparently, quite independent of other facial development. Sometimes, also, the lunules are wholly black, while another time they disappear altogether, and the whole hind wing is then fuscous, as in ab. *nigra*, Tutt, ab. *atrebatensis*, Boisd. Occasionally the lunules of the fore wings differ in colour from those of the hind wings *in the same specimen*. This is the case, for instance, in ab. *ioprotoformis*, fig. 10, the lunules of the hind wings being blue, those of the fore wings yellowish white.

Together with the lunules the outer borders of the wings also vary considerably.

Thus in fig. 7 the costal lunules are not separated by the usual fine black line from the outer brown border, which here tends to disappear, while in figs. 8 and 9 it is revealed as part of the brownish band in which the separate lunules "float."

The orange, yellowish, or whitish suffusion at the base of the lunules, which is often brilliant in the type, disappears in these specimens altogether, the borders then reminding somewhat of the wing-borders in *V. io*.

(To be continued.)

SOME EUROPEAN FOSSIL BEES.

By T. D. A. Cockerell.

When recently in Zürich I took the opportunity to make a critical examination of a number of fossil bees described by Heer from the Miocene of Œningen.* For every facility in this work I am indebted to the kindness of Professor Albert Heim, in whose custody the collections are. The splendid collection of fossil insects at the Zürich Polytechnicum would afford opportunity for many months of fruitful study, and it is much to be regretted that it has been, and is so greatly, neglected by entomologists.

Lithurgus adamiticus (Heer).

Apis adamitica, Heer, Foss. Hym. aus Œningen und Radoboj, p. 4, taf. III. fig. 11. Urwelt der Schweiz, f. 287.

This was described, and has since been cited by authors, as a veritable *Apis*, closely related to the living honey-bee. An examination of the type shows that the resemblance to *Apis* is merely superficial, and, so far as can be seen, the insect essentially agrees with *Lithurgus*. The shape of the abdomen accords well with female *Lithurgus*: the abdomen is a little over 8 mm. long, 4 broad, truncate basally, pointed apically, as preserved warm red-brown with the first three sutures colourless; Heer's figure of the first segment shows the *Lithurgus*-like form. The thorax is short, of the same colour as the abdomen; the legs are not visible. The wings seem short for the size of the insect; the venation is only partly preserved. Marginal cell relatively short, pointed, the end symmetrical, not approaching apex of wing; all this exactly as in *Lithurgus*, and different from *Apis*, or even *Megachile*, the latter having the cell much more obtuse. Stigma slightly developed, as in *Lithurgus*, the part projecting over the marginal cell short, herein like *L. atratiformis*, Ckll.† Basal nervure hardly deflected at the junction of the two sections, and with the upper section relatively long; all this as in *L. atratiformis*, and contrasting with the European *L. fuscipennis*.

* The fossil-beds, cited in all the literature as of Œningen, are actually on the hill above Wangen, and some distance from Œningen. My wife and I visited the place, and collected a series of fossils, but did not obtain any bees.

† Specimens from Tahiti compared.

Basal nervure to base of marginal cell about equal to half length of cell. At first sight one seems to see indications of a third submarginal cell, as figured by Heer, but this is illusory, and is negatived also by the fact that the broad second submarginal receives both the recurrent nervures, the first very near the base, the second some distance from the apex; this differs a little from modern *Lithurgus*, in which the second recurrent is received nearer the apex. The shape of the second submarginal cell also differs from that in living *Lithurgus*, in that it is less constricted above, the second transverso-cubital nervure going more directly to the marginal. Basal nervure meeting the transverso-medial a little on the apicad side; it falls distinctly short of it in modern *Lithurgus*.

All things considered, therefore, the Œningen bee must be placed in *Lithurgus*, with the remark that it is somewhat less modified or specialized in venation than the living species. It might possibly be justifiable to distinguish it sub-generically. In Prussian amber, of Oligocene age, there are two extinct genera of bees possessing only two submarginal cells, and probably referable to a group from which the Megachiloids (including *Lithurgus*) sprung. *Glyptapis mirabilis*, Ckll., has a venation not very unlike that of *Lithurgus adamiticus*, but the stigma is relatively long and narrow. This is, however, a little black bee, slightly over 5 mm. long, with *hairy eyes*, mandibles with a broad cutting edge notched near the apex, metathorax divided by ridges into large subquadrangular areas. The hairy eyes of *Glyptapis* are especially interesting, because this character exists to-day in the parasitic Megachiloid genus *Cœlioxys*. (In the African * *C. decipiens*, Spin., the eyes are naked however.) In the other amber genus referred to the eyes are bare. *Ctenoplectrella viridiceps*, Ckll., is a small stout bee like *Glyptapis*, hardly 5 mm. long, claws strongly cleft, pulvillus large, malar space very short, wings dark rufo-fuliginous, stigma large, second submarginal cell receiving first recurrent nervure some distance from base, and second not far from apex. These amber bees, and many others which I have described, are in the museum at Königsberg, where a full account of them is in process of publication. All of the Prussian amber bees, so far as seen by me, are of extinct genera; but the Miocene bees, whether of Europe or America, include various living genera.

Xylocopa abavus (Heer).

The "type" is a bee with a broad thorax; no head or abdomen visible, and the venation cannot be made out. The legs show a scopa, and the hind tibia is very broad, with a gently curved longitudinal ridge visible on both sides, and,

* Specimen from Willowmore, Cape Colony (*Brauns*).

therefore, certainly natural. This ridge is normal for *Xylocopa*, to which the *Bombus abavus*, Heer (*tom. cit.*, p. 5), must apparently be referred. The only doubt arises from Heer's figure, which represents a similar-looking object, but with head and abdomen. The Zürich specimen may therefore not be the true type.

Another *Xylocopa* (*X. senilis*, Heer) has been described from Œningen. The type appears to be at Carlsruhe, and I did not see it.

Xylocopa jurinei (Heer).

Bombus jurinei, Heer, *tom. cit.*, p. 4, taf. III. fig. 8.

The type is a very large and stout-bodied bee, like a *Bombus*. Head lacking, abdomen 12 mm. wide, hind legs with a coarse scopa, marginal cell with a dark cloud. Only part of the venation can be made out, but all that can be seen agrees with *Xylocopa*, and not with *Bombus*. The second recurrent nervure can be seen entering the third submarginal cell far from its end, and the shape of the cell (base and extreme apex not visible) is as in *Xylocopa*. The lower side of the cell is arched before the insertion of the recurrent nervures, as in *X. violacea*. The apical part of the second discoidal cell can also be seen, exactly as in *Xylocopa*. There is also visible a considerable part of the venation of the hind wing, showing the transverso-cubital, and the ends of the marginal and cubital nervures, quite as in *Xylocopa*.

Anthophorites titania (Heer).

Scutellum broad and flat; mesothorax rather small; metathorax with apparently a sharp edge separating base from apical truncation; head absent; first abdominal segment narrowed basally, the abdomen broadest at middle of third segment; stigma narrow, rather well-developed; upper section of basal nervure shorter than lower; marginal cell sharply pointed, rather broad basally; rest of venation cannot be made out.

The specimen here described is supposed to be the type, but it is evidently not the one figured by Heer. The species was described from two specimens from Œningen in the Carlsruhe collection; perhaps the one now at Zürich is one of them. The genus *Anthophorites* cannot be precisely defined, but includes various fossil bees supposed to be more or less similar to *Anthophora*. I herewith designate Heer's first species, *A. mellona*, as the type.

The generic position of *A. titania*, at least as exemplified by the Zürich specimen, remains obscure.

Anthophorites longæva, Heer.

♀. Clearly a bee; eyes large; face narrow; middle joints of the rather stout flagellum a little longer than broad; abdo-

men with fine hair, and broad at base, not at all like the specimen of *A. titania*; hind tibia $3\frac{3}{4}$ mm., hind basitarsus about $2\frac{1}{2}$ mm.; hind basitarsus broadened; venation cannot be made out. The generic position of this specimen must remain wholly obscure.

A. longæva was based on two specimens, which, judging from Heer's figures, are probably not even congeneric. The specimen above described is from Œningen, but Heer's first one, from Radoboj, must be considered the true type.

"*Osmia.*"

In 1849 Heer published *Osmia antiqua* from Œningen. This was a poorly preserved insect, which cannot apparently be referred to *Osmia* or any other genus with certainty. In Heer's work, translated and edited by Heywood, 'The Primæval World of Switzerland' (1876), vol. ii. p. 43, I find a statement that there were three species of *Osmia* at Œningen. In the collection at Zürich I find three species from that locality, bearing manuscript names by Heer. One of these, an insect about $9\frac{1}{2}$ mm. long, the abdomen almost 6 mm., shows no venation, and is worthless for descriptive purposes. One is a wasp. The third may be described as follows:—

Andrena (?) *primæva*, n. sp. ♀.

Osmia primæva, Heer, MS. A medium-sized species, with broad subglobose abdomen, clearly a bee. Thorax small; hind legs preserved, showing scopa; three submarginal cells.

The hind legs are robust, formed as in *Andrena*, except that the broad hind femur is swollen above at base; this condition is, however, distinctly approached in some species of *Andrena*. The tibia and broad basitarsus, the latter showing much long hair along its hind margin, are exactly as in *Andrena*. The middle basitarsus is a little longer than the small tibia, and is quite broad, narrowing somewhat toward the base. The form of this basitarsus is rather unusual, but finds a close parallel in *A. hattorfiana* (Fabr.).

The venation, so far as visible, is as follows: stigma long and well-developed, quite normal for *Andrena*; marginal cell quite normal, the apex narrowly rounded, just away from costa, as in *A. morio*; second submarginal cell approximately square, receiving the first recurrent nervure about the middle, as in *A. errans*; third submarginal cell fully twice length of second, but about equally broad on marginal, receiving the second recurrent nervure just before the beginning of the last third; third transverso-cubital with a single curve, not at all angulate; second recurrent nervure normal in form.

The relatively long third submarginal cell suggests *Nomia*, but occurs also in *Andrena*, e. g. *A. albicans*. In the hind wing the marginal, cubital, and transverso-cubital nervures are visible, entirely as in *Andrena*. The transverso-cubital is a little oblique, the lower end most basad.

All things considered, the reference to *Andrena* seems reasonably assured.

Hab.—Miocene rocks at Œningen (*i. e.* Wangen), Baden.

Apis mellifera (L.).

In the Museum of Cambridge University is a piece of amber from the coast off Yarmouth, containing two specimens of genuine *Apis mellifera*, side by side. As preserved, the eyes and ocelli are a fine crimson, evidently from the eye-pigment, and the face and front are a deep metallic reddish, perhaps from a suffusion of the same substance. The basal nervure can be seen falling far short of the transverso-medial, and the other characters of the venation, legs, &c., agree with the honey-bee. The amber, as the museum records show, was purchased in the rough by Benjamin Burwood from fishermen in or near Great Yarmouth. The bees, and other amber insects from the same source, were crudely figured by A. S. Foord in Trans. Norf. and Norw. Nat. Soc. vol. v. pt. 1 (1890). The other specimens, also now in the Cambridge Museum, include Coleoptera and Diptera, and a cockroach labelled *Blatta orientalis*, but evidently not that species, and apparently not identical with any living British form. It is well preserved, and should be studied by a specialist in these insects.

Conwentz has given a full discussion of English amber in 'Natural Science,' 1896. Its age has not been precisely ascertained, but if the specimen containing honey-bees is authentic, it must be Pliocene at the oldest, and cannot possibly have anything to do with the true Baltic amber of Oligocene age. Conwentz remarks, however, that much of the succinite in shops at Cromer is imported from abroad in order to satisfy the demand of visitors to the seaside, and from the appearance of the piece containing *Apis*, I cannot help suspecting that it is really copal, and not of English origin at all. Some of the pieces containing beetles seem to be genuine, however, and these should be critically examined.

University of Colorado, Boulder:
September 14th, 1909.

NOTES AND OBSERVATIONS.

Pupation of Xanthorhoë (Melanippe) fluctuata.—It has been stated that the larva of *X. fluctuata* having made its frail, underground cocoon, postpones the pupal change for a rather long time, perhaps even the entire winter. Some larvæ of this species that I reared last September–October, in a glass tumbler with a little earth at the bottom, formed their cocoons in the soil but against the glass. This method of construction enabled me to see the larva in its cell,

the glass, serving as a window, being only slightly obscured by the flimsy silk lining spun over it. In the three cases where direct observation was possible, the pupa was formed in six to seven days after the larva had fashioned its habitation.—Richard South.

A. paphia var. valesina.—Of seventy-seven specimens of *Argynnis paphia* bred this year from ova obtained from a New Forest specimen of *valesina* (male unknown), forty-one emerged type males, twenty-three type females, thirteen var. *valesina*. Unfortunately I was unsuccessful in obtaining a pairing, as it would be interesting to know what percentage of *valesina* would be produced when the male was bred from a *valesina* parent.—E. C. Joy: 2, St, Kilda's Road, Stoke Newington, London, W.

Aberration of Arctia caia.—A striking aberration of *Arctia caia* was bred from a larva (found by her near her house) by Mrs. Gilbert Humphry, of West Wittering, near Chichester, in July last. The specimen is asymmetrical. The right fore wing is almost entirely brown, whilst the left has the markings clearly indicated. The hind wings are of a unicolorous dark shade, though the dark spots are visible. The moth much resembles the specimen (No. 3) figured in Newman's 'History of British Moths.'—Joseph Anderson; Chichester.

Acidalia degeneraria.—In connection with the note on this moth ('Entomologist,' *antea*, p. 280), perhaps the following remarks on its occurrence in the Isle of Portland many years ago may be of interest:—"1854, from July 2nd to the 11th twenty-four specimens were taken by myself and thirty-five by the late Mr. Frederick Bond. By the 11th of July they had become worn and shabby. In the following year, 1855, from July 3rd to 25th, one hundred and forty-four were taken by myself, and thirty-six by my cousin (the late Rev. H. Adair Pickard). By the 11th of July, in this year, the moth had, as in the previous year, become worn and shabby, but suddenly, just after that date, an entirely fresh brood appeared to have come out, and the greater number of the hundred and forty-four I obtained were from that time to July 25th, when the specimens were still in fair condition. I noticed particularly that the purplish bands in this second brood were, as a rule, of a more dull and dusky hue than in the first; though in the first brood the brightest coloured and largest specimens occurred."—O. Pickard-Cambridge; Bloxworth Rectory, November 17th, 1909.

The Clark Collection.—The first portion of the collection of British Lepidoptera formed by the late Mr. J. A. Clark was dispersed at auction at Stevens's Rooms on Tuesday and Wednesday, November 2nd and 3rd. The specimens were, as a rule, in good condition, but, except in the case of good varieties or rare species, generally without *data*. Competition for the better lots was keen, several of those present at the sale evidently being bent upon securing some of the more unusual forms, in which the collection was particularly rich, with the result that the two days' sale realized a total of approximately four hundred pounds. Among the more important lots,

"a magnificent rayed variety" of *Pyrameis cardui*, "figured in the 'Entomologist,' vol. xiii. p. 73," sold for £12 12*s*., and "a remarkable variety" of the same species, also "figured in the 'Entomologist,' vol. vi. p. 345," brought £10 10*s*. Of *Argynnis aglaia*, a variety "with large black blotches" realized £5 5*s*., and "a silvery variety figured in South's 'Butterflies,' pl. 61, fig. 3," £7 10*s*.; while for "a very beautiful variety" of *Melitæa aurinia*, also figured in South's 'Butterflies,' pl. 56, fig. 6, £6 was obtained. Two good blotched forms of *Vanessa urticæ* brought £1 5*s*. and £1 15*s*. respectively; an exceptionally dark *Pieris napi* from Co. Londonderry, with others, £1 12*s*. 6*d*.; and a fine black variety of *Limenitis sibylla* a like amount. Four good forms of *Chrysophanus phlæas* sold as follows, *viz*. one almost unicolorous dark brown for £1 4*s*., one with the row of spots in fore wings joining the margin, making a black border, £5 10*s*., a pale straw-coloured variety £1 12*s*. 6*d*., and one of a pale golden colour 18*s*.; and a "leaden" coloured specimen of *Lycæna adonis* reached £4 6*s*. before the hammer fell. The "hermaphrodite" butterflies included a fine and perfect *Argynnis paphia*, which sold at £2 4*s*.; *Lycæna ægon*, with others, at £1 1*s*.; two rather worn *L. icarus* at 13*s*. and 11*s*. respectively; and a small but fine *Cyaniris argiolus* at £5.

Among the varieties of moths the highest price obtained was £15 for a fine female specimen of *Saturnia carpini* of a uniform brownish black colour, with the ocelli showing still darker, which was taken by the late Mr. J. A. Clark at Tunbridge Wells on June 3rd, 1878. A black *Dicranura vinula* bred from a larva found on Hackney Marshes realized £7 15*s*.; a nice light *Asphalia ridens*, £1; and an IVI female of *Setina irrorella* brought the same figure. There were a large number of *Arctia caia*, one of which having the fore wings almost entirely brown, and the hind wings with broadly confluent black markings, sold for £9, and another somewhat similar for £8 8*s*., while others also put up singly or grouped with one or two specimens of lesser note fetched £6, £5 10*s*., £3 10*s*., £3 7*s*. 6*d*., £3, and so on down to a few shillings a lot; and a nice light variety of *A. villica* was knocked down at £2 5*s*. A specimen of *Rumia cratægata*, with markings entirely absent, made £1 1*s*., and one of a uniform pale brown 15*s*.; a very pretty variety of *Venilia maculata*, with two large dark blotches in each fore wing, £4 4*s*., and another almost entirely dark brown dusted with yellow, £4. Among the rare and extinct species, *Chrysophanus dispar* brought £7 10*s*. for a large richly coloured male, and £6 10*s*. for a fine large female, while other specimens in good order ranged from £4 4*s*. to £3. *Lycæna acis* went for from 6*s*. to 14*s*. a pair, the higher price named being for a lot in which the female was said to have been taken at Deal in 1879. *Lælia cœnosa*, in good condition, realized from £1 1*s*. to £1 15*s*. a pair; *Gastropacha illicifolia*, 7*s*. to £1 each, and one "bred 21st May, 1889, from larva found at Church Stretton by F. B. Newnham," £1 4*s*. A pair of *Crymodes exulis*, "Loch Laggan, N. Cook," sold for £2, and two lots of three each of the Shetland form for £1 8*s*. and £2 2*s*. per lot; while *Noctua subrosea* varied from £2 15*s*. for a fine female to 10*s*. 6*d*. for a pair in less perfect condition. Two specimens of

Orrhodia erythrocephala, "captured by J. H. A. Jenner, Lewes," brought £2 5*s*. the lot; and four specimens of *Xylina zinckenii* from 18*s*. to £1 4*s*. each. Ten specimens of *Cleora viduaria* put up singly realized from 10*s*. to £1 10*s*. each, with an average price of just over 16*s*. 6*d*., and three fine examples of *Boletobia fuliginaria* captured by the late Mr. J. A. Clark, two in Lower East Smithfield, and one in St. Katherine's Docks, just £2 2*s*. each after a keen competition.—R. A.

The Barker Collection.—Yet another collection of British Lepidoptera, but of smaller size, has come under the hammer, that formed by the late Mr. H. W. Barker being disposed of at Stevens's Auction Rooms on November 16th. There were few really interesting lots, but among the more noteworthy a fine *Lycæna adonis* female, with splashes of male colour in left fore wing, brought £3 15*s*.; a male *L. corydon*, under side very near var. *obsoleta*, with a nice blue shot female, £1 the pair; a fine male *Nemeophila russula*, with hind wing much suffused with black, and another with quite clear hind wings, £2 15*s*. the two; a couple of confluent-spotted *Arctia villica*, with two fairly darkly-marked *A. caia*, £1 2*s*. the lot; and a fine series of thirteen *Cymatophora fluctuosa* £1 12*s*. 6*d*.—R. A.

Wanted.—For breeding experiments in Heredity and Sex-determination, pupæ of *S. mendica* and its (Irish) var. *rustica*.—L. Doncaster; Zoological Laboratory, University, Birmingham.

CAPTURES AND FIELD REPORTS.

Abundance of Pieris brassicæ.—Following on Mr. Joseph Anderson's note on this species (*antea*, p. 282), it may be of interest to mention that *Pieris brassicæ* began to be seen in goodly numbers about the gardens in Eastbourne and on the railway-banks on the way to London about Aug. 12th, and from that time it became more and more common until about the 22nd of that month, when it was met with in unusual abundance not only in the town, but on any sheltered parts of the downs where there were any flowers to attract it. It then gradually diminished in numbers until, by the beginning of October, only an occasional specimen was to be seen. I did not observe any concerted movement on the part of the butterflies, nor was it a case of the sudden appearance of large numbers as has been observed under the influence of migration, but just a gradually increasing number of individuals quite compatible with the natural development of unusually large broods. By the end of September full-fed larvæ also were frequently seen wandering in search of suitable places for pupation, and not a few found their way in at the windows of the house where I was staying, although there was no adjacent cabbage-garden, and spun up on the walls and ceilings of the rooms; and little bunches of yellow ichneumon cocoons, as well as healthy pupæ, were not infrequently seen under the copings of walls in the neighbourhood.—Robert Adkin; Lewisham, November, 1909.

OCNERIA DISPAR AT EASTBOURNE.—On the evening of August 30th last, on my way home from the train, I captured a female *Ocneria dispar* from the trunk of an elm-tree, where it was resting in an apparently torpid condition. It is an unusually large specimen, measuring 74 mm. from tip to tip of the wings, and is somewhat greyer in colour than usual, possibly owing to the loss of wing-scales, although the fringes are in fairly perfect condition. The situation where it was taken is an unlikely one for the species to have bred wild in the immediate neighbourhood, nor has the specimen the appearance of one that had been reared in captivity; there should, however, be no difficulty in this latter point being set at rest.—ROBERT ADKIN.

COLIAS EDUSA AT EASTBOURNE.—Although frequently over the most likely spots in the neighbourhood of Eastbourne during the months of August and September last, the only example of *Colias edusa* that came under my notice was a travel-stained male captured by a friend on the morning of September 17th. The species cannot have been common in Britain during the past autumn, but probably some few specimens may have been noted, and it would be interesting if all such cases were put on record, with particulars of date when met with, and sex and condition of the specimens where known.—ROBERT ADKIN.

STAUROPUS FAGI.—As the "lobster moth" seems to be still of unfrequent occurrence, it is perhaps worth while to record a male taken by myself early in June last; it was on a pane of my study window, and perfectly quiet. In my present crippled condition I had some difficulty in securing it, but first and last it never moved, and had apparently never flown; no bred specimen could be in finer condition. The only perfect insect of this species I have ever before taken here was a female, on the trunk of an oak many years ago; though from the year 1852 at various considerable intervals of time up to now I have met with the larva, but never succeeded in getting a perfect insect; the result having always been that the larva either died after changing to a chrysalis, or else produced an "ichneumon."—O. PICKARD-CAMBRIDGE; Bloxworth Rectory, November 17th, 1909.

ABUNDANCE OF THE LARVÆ OF PIERIS BRASSICÆ.—With reference to Mr. Joseph Anderson's note (*antea*, p. 282) on the extraordinary abundance of the larvæ of *P. brassicæ* in the neighbourhood of Chichester, I should like to record their equal abundance in this district, for most of the plants of broccoli, Brussels sprouts, savoys, &c., in the gardens about here present the same melancholy spectacle of bare stalks, and the palings and walls adjacent are covered with their chrysalids, and the yellow nests of cocoons of *Apanteles glomeratus*; and there are still quantities of larvæ to be seen on the plants, or crawling about the walls looking for sheltered corners wherein to pupate, notwithstanding the severe frosts, snow, and hail we have experienced during the last week. I did not notice that the perfect insects were in any way more numerous than usual at the end of

July or in August. — Gervase F. Mathew; Dovercourt, Essex, November 17th, 1909.

Scarcity of Vanessids.—One of the peculiarities of the past remarkable season has been the dearth of the Vanessids. Hybernated specimens of *io* were tolerably plentiful in the spring, and a fair number of fresh examples appeared in August, but of the other species I have not seen more than half a dozen *atalanta*, and about a dozen *urticæ*, either in this district or in the neighbourhood of Instow, North Devon, where I spent the latter part of June and most of July. *Cardui* or *polychloros* I never saw at all, nor did I observe any nests of larvæ of either *io* or *urticæ*.—Gervase F. Mathew.

Note on Vanessa io.—With reference to Mr. F. W. Frohawk's note (*antea*, p. 260), the recent abundance of *Vanessa io*, to which he calls attention, must have been partial and not general throughout the country. In this neighbourhood the insect has, in my experience, been no commoner than usual this season, in explanation of which statement it may be added that I rarely, if ever, set eyes on half a dozen specimens, and sometimes see none at all, in the course of a single year!—Eustace R. Bankes; Norden, Corfe Castle, November 17th, 1909.

Sirex noctilio and S. gigas at Chichester.—A female *Sirex noctilio* was taken in the kitchen of the Rev. R. Codrington, The Close, Chichester, on September 14th of this year, where its intrusion created some dismay amongst the domestics. The treatment to which it was subjected in consequence had not improved its condition when it reached my hands. On the 26th of the same month a *Sirex gigas* was captured in the neighbourhood.—Joseph Anderson.

Charæas graminis in S. Wales, 1909.—There has been a plague of *graminis* larvæ on the hill pastures of this district this year. At the end of May and the early part of June the nearly full-grown larvæ were crawling over the ground in thousands, and several farmers complained to me of the damage they were doing to the pastures. About the middle of July I found great flocks of crows and other birds were frequenting the hills, attracted by the abundance of pupæ and full-fed larvæ. The grass and other plants were pulled up by the birds in their search, and after observing their *modus operandi* I entered into competition with them, and in less than two hours had obtained on a small area of ground over three hundred pupæ. On pulling up a tuft of withered grass which showed signs of having harboured the larvæ, I sometimes shook out as many as six, eight, or ten pupæ at a time. When the date came for the moths to emerge I found many had been ichneumoned, but I obtained a very nice lot of insects. I understand that some parts of Glamorgan had a similar visitation in 1884.—G. Fleming; 9, Fairview Terrace, Merthyr Tydfil, October 5th, 1909.

Leucania l-album at Eastbourne.—On October 14th I took a female example of the above-named species at ivy, which has since laid a few ova. I have worked the same locality every suitable

evening since, with no further success.—Edwin P. Sharp; 1, Bedford Well Road, Eastbourne, October 26th, 1909.

L. favicolor in Sussex.—During the summer of 1908 I took a specimen of this insect in East Sussex (exact locality suppressed for obvious reasons). It was not till a recent meeting of the South London Entomological Society that the specimen was identified as the species named, although I personally had no doubt of its identity. The specimen (almost var. *lutea*) is now in the collection of Mr. A. E. Gibbs, St. Albans, who kindly got it identified for me.—W. Jarvis; 73, Murchison Road, Leyton, N.E., October 26th, 1909.

Note on the Pupæ of Nonagria geminipuncta. — I notice (*antea*, p. 260) that Mr. Vinall mentions finding nine pupæ of *N. geminipuncta* in one reed. It may be interesting to note that, in Kent, I once found five pupæ between two nodes of one reed-stem. — H. M. Edelsten; Forty Hill, Enfield, Middlesex, October 26th, 1909.

Larvæ of Hadena pisi on Bog-Myrtle.—Referring to Prof. Meldola's note (*antea*, p. 284), I may say that the larvæ of this species are also common on bog-myrtle in the New Forest, especially on the open bogs near the railway line at Holmsley, and I have also found them in the vicinity on bracken occasionally. The species occurs in this district, and I found one larva feeding on gooseberry leaves in my garden, but it does not appear to be common hereabouts.—C. Nicholson; 35, The Avenue, Hale End, Chingford.

Vanessa Io and Gonepteryx Rhamni.—Mr. F. W. Frohawk calls attention to the great abundance of the former species in S. E. Essex. I have been astonished at the abundance in this district, as for years I have not seen many. *G. rhamni* has been unusually plentiful here.—E. Everett; Letchworth.

Abundance of Larvæ.—Larvæ of *Triphæna pronuba* are in enormous numbers in the garden here this autumn, feeding on almost everything. I have never seen them so abundant. Perhaps other entomologists may have noticed the same thing.—H. M. Edelsten.

Lycæna corydon in Devonshire.—With regard to my former note (*antea*, p. 211) on the occurrence of *Lycæna corydon* in Devon, this further information may be of interest. On August 13th last I visited the same spot where I took one male *corydon* last year, and caught three males, though I only stayed about half an hour; all appeared quite fresh. I had no time to search for females, and was unfortunately prevented from paying another visit to the place. However, I think it safe to assume that those three males were not stragglers, but that there is a colony of the species in that locality (which is on the slopes above the sea, about two and a half miles *west* of Bear Head). I may add that on the bank where I took the specimens referred to, the horseshoe vetch (*H. comosa*), which I believe is one of the food-plants, grows abundantly, and this plant also supports there a flourishing colony of the beautiful *L. adonis*.—F. L. Blathwayt; 1, Stonefield Avenue, Lincoln, August 26th, 1909.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 20th*, 1909.—Dr. F. A. Dixey, M.A., M.D., President, in the chair.—Mr. Alfred Newstead, of the Grosvenor Museum, Chester, was elected a Fellow of the Society.—The Secretary announced that Mr. G. T. Bethune-Baker and Dr. Malcolm Burr had been elected members of the Council in the place of Mr. G. A. K. Marshall, and Mr. R. Shelford, resigned.—Mr. W. G. Sheldon exhibited series of the butterflies collected by him at Budapest and Herculesbad during the past summer, including *Chrysophanus dispar*, var. *rutilus*, *C. alciphron*, *C. thersamon*; *Plebeius argyrognomon*, *Polyommatus orion*, gen. vern. *ornata*; *Melitæa trivia*; *Brenthis hecate*; and *Pyrgus orbifer*.—The Rev. G. Wheeler brought for exhibition series of butterflies taken by him this year in Central Italy. They included a very fine aberration of *Melanargia galatea*, the left upper wings almost entirely black; the right side much coloured; and examples of *Agriades thetis* (*bellargus*) var. *polonus*, Zll., from Assisi.—Mr. J. W. Tutt gave instances of the occurrence of var. *polonus*, stating that he had himself found it at Cuxton, Kent, where it flew in company with *A. thetis*, and is undoubtedly a hybrid between that species and *A. corydon*, the genitalia being similar, and the food-plants identical.—Mr. G. Talbot showed a remarkable new Lycænid butterfly from the Cameroons—now in the collection of Mr. W. J. Adams—probably constituting a new genus. The neuration most resembles that of the genus *Aslauga*, Kirby, but varies chiefly in the different place of origin of the subcostal nervures of the fore wing, and in the scalloped margin of the hind wing.—Mr. J. W. Tutt exhibited examples of *Spilosoma mendica* bred by Dr. Chapman from the ova found at Hyères, Var., the females mostly normal, but some with a well-defined black border round all the wings.—Mr. W. J. Kaye exhibited series of the two species of *Heliconius*—*H. chestertonii* and *H. weymeri* from Western Colombia. The series of *H. weymeri* included beautiful transitional forms to the aberration *gustavi* in which all trace of the fore wing markings had vanished. He said that probably there was some common influence at work to produce a black fore wing, as this phenomenon was found in several other species of *Heliconius* from Colombia, particularly in the Canea Valley. *Heliconius doris* in both its red and blue hind winged forms produced black fore wing aberrations known as *abtecta*. *Heliconius ismenius* also occasionally produced much darkened forewings.—Dr. T. A. Chapman gave the results of some temperature experiments made by him upon the larvæ of *Pieris brassicæ*. Some at 56° Fahr. took four or five or even more days to pupate. Others at 86° had all pupated in forty-eight hours in each lot so treated. The pupation of a number seemed to be so accelerated that they had not time to make their suspension complete or correctly, and of these not a few did not pupate satisfactorily; the girth catching them in an awkward place, or the larval skin unsuccessfully passing it, &c. After sixteen days there is no sign of any of these making an autumn emergence, though, of the hundreds of ichneumons—*Apanteles glomeratus*—a few dozens came out at the end of eight or nine days from capture of larvæ; or eight from escape of ichneumon larvæ

from caterpillars.—Mr. E. C. Bedwell showed eight examples of *Odontoscelis dorsalis*, Fabr., taken at the roots of *Erodium* on June 21st last, in the neighbourhood of Lowestoft, Suffolk. This is the first record of the species occurring in Britain.—Professor T. Hudson Beare exhibited a specimen of *Cryptamorpha desjardinsi*, Guér., taken by Mr. J. Taylor, of Sandown, I.W., in a bunch of bananas, on August 30th last.—Mr. H. St. J. Donisthorpe exhibited examples of *Chætocnema arida*, Foudras, a species of Coleoptera new to Britain, taken near Ryde, August 26th, 1909 ; and varieties of *Cassida nobilis* (also exhibited by Mr. J. W. H. Dollman), from St. Helens, I.W., August 1909.—Mr. Donisthorpe also showed two examples of *Formica sanguinea*, Latr., one being half male half hermaphrodite, and the other half male half female, taken in Bewdley Forest in July; and of one example of *Myrmica scabrinodis*, Nyl., half male half hermaphrodite, taken by Mr. Dollman at Ditchling, in September last.—Dr. T. A. Chapman, M.D., F.Z.S., communicated a further series of photographs and "Notes on the Ancillary Appendages of Species of *Plebeius*, to illustrate the Relationships of *Plebeius argus* (*ægon*)."—Mr. R. Shelford, M.A., F.L.S., C.M.Z.S., communicated a paper "On Two Remarkable Forms of Mantid Oothecæ."—Mr. C. T. Pead communicated "Notes on Some Rare or Little-known South African Homoptera," with examples of the several species.—Mr. W. F. H. Rosenberg then read a "Note on the Liability of Butterflies to Attacks by Birds and Lizards," being an account of his observations in Colombia and Ecuador on the subject treated in Mr. G. A. K. Marshall's paper recently published in the Society's "Transactions." Mr. Marshall congratulated Mr. Rosenberg on his extremely interesting remarks, and said that he had been endeavouring to stimulate entomologists in the Tropics to make observations on the behaviour of birds, &c., towards butterflies by sending copies of his paper to them.—The President, Mr. G. C. Champion, Mr. J. W. Tutt, Dr. T. A. Chapman, and other Fellows continued the discussion.—H. Rowland-Brown, M.A., *Hon. Secretary*.

The South London Entomological and Natural History Society.—*October 14th*, 1909.—Mr. A. Sich, F.E.S., President, in the chair. — Mr. F. Noad Clark exhibited various species of "ticks" in illustration of his paper.—Mr. Moore, exotic species of "ticks."—Mr. West (Ashtead), a *Vanessa io* with right side wings noticeably smaller than those on the left.—Mr. Tonge, a tuft of the "flowering lichen," *Usnea barbata*, from the New Forest, and a fine series of *Sesia apiformis*.—Dr. Hodgson, varied series of *Cyclopides palæmon* and *Urbicola comma*.—Mr. Newman, long series of *Aglaia urticæ* and *Papilio machaon* showing variation in size and intensity of markings. —Mr. R. Adkin, ova of *Agriades bellargus* in situ on under sides of leaves of *Hippocrepis comosa*, with full notes on the actions of the female in deposition. He also showed young larvæ of *Celastrina argiolus*, and larvæ, pupæ, and cocoons of *Nola albulalis*.—Mr. Tonge, stereographs of the ova of *A. bellargus*. — Mr. West (Greenwich), *Apion curtisii*, *A. tæcicolle*, *A. pomonæ*, and *A. urticarium* from Deal. —Mr. Joy, bred specimens of *Dryas paphia* var. *valesina* bred from a captured female (forty-one typical males, twenty-three typical females,

thirteen var. *valesina*).—Mr. Step, the fungus *Russula adusta*, with its parasite, another fungus, *Nyctalis parasitica*.—Mr. South, for Mr. Baxter, a *Luperina* sp.* from St. Annes-on-Sea, Lancs, and read notes on *L. testacea* and its forms and allies, and also an interesting series of *Peronea variegana* and its named forms.—Mr. H. Moore, a second brood (?) specimen of *Spilosoma lubricepeda* from Deptford, Sept. 18th; and two instances of Müllerian mimicry, *Heliconius telesiphe* and *Colœnis telesiphe*, and *Victorina steneles* and *E. dido* from South America.— Mr. Noad Clark read a paper "A Few Stray Notes on Ticks," and showed a large number of very admirable lantern-slides.—H. J. Turner, *Hon. Report. Sec.*

RECENT LITERATURE.

Noctuelles et Géomètres d'Europe; Iconographie Complète de toutes les Espèces Européennes. J. Culot. Part I. Noctuelles. Genève. July, 1909. 3 fr. 75 cent. (each part).

We have received the first part of this work from M. Culot, and have much pleasure in bringing it to the attention alike of British collectors and of those interested in the more extended fauna of the Continent of Europe. The work owes its inspiration to M. Charles Oberthür, of Rennes, who has already done so much splendid work in figuring the Lepidoptera of the world; and is intended to provide a reliable and accurate guide to all the Heterocera included in the groups under review. As scientific handbooks, there is no doubt that contemporary German works leave much to be desired in the matter of detailed accuracy of the plates. Produced at popular prices, it is inevitable that the figures should be lacking in that refinement and minute fidelity to the model which alone ensure successful identification of the more perplexing and difficult genera. The processes adopted by the publishers allow little scope for the artist: the often subtle superficial differences of allied species are not seldom wholly lost. As M. Oberthür says in his charming preface, the ideal illustrator is the entomologist who is also a highly skilled artist, assisted in the reproduction of his work by the best machinery at the disposal of the printer. M. Culot, whose art is familiar to all Continental entomologists, most happily unites these qualifications, and the two plates before us, plate i. of Noctuas, Acronyctas, &c., and plate i. of Geometers ("Emeralds") are the *dernier cri* of hand-colour engraving. M. Oberthür believes that not a few of his compatriots are deterred from extending their entomological researches into the Heterocera by reason of the difficulties experienced by collectors in getting their captures named and classified. "There is, however," he proceeds to say, "a fortunate country where such complaints have no *raison d'être*, and that is England. Entomology flourishes there; and entomologists are ever growing more active in the field, and more numerous." We have the monographs of Charles Barrett and Mr. J. W. Tutt, he points out, affording abundant material for the student, while many public collections are open to

[* Since determined as *L. gueneei*, Doubleday (see *antea*, p. 289).—Ed.]

students. Yet, though fully appreciating the illustrations of the late Charles Barrett's great work on British Lepidoptera, we are bound to confess that, with the facilities now afforded M. Culot, a very much higher degree of excellence would have been attained, while Mr. Tutt, of course, has barely touched the subject of this monograph, and his later volumes have not the advantage of coloured illustrations. We can, therefore, the more confidently recommend the method adopted by M. Culot, which relies less upon highly technical and meticulous descriptions than colour presentations to record individual characters, and cordially advise those of our readers who are interested in the subject to apply for full and further particulars from the author and illustrator, Villa-les-Iris, Grand Pré, Geneva.

H. R.-B.

Butterflies and Moths of the United Kingdom. By W. Egmont Kirby, M.D. Pp. i.–lii. and 2–468. With seventy coloured plates. Medium 8vo. London: George Routledge & Sons, Ltd.

In these days of general entomological progress, one expects that the latest book on the lepidopterous fauna of a country should, as its *raison d'être*, exhibit either distinctive features in illustration, or some novel method of presenting the subject. The introduction of some coloured figures of larvæ among those of the imagines on the plates, as has been done in the inexpensive volume before us, is certainly a welcome innovation that will appeal to the nature lover for whom, chiefly, the book has been produced.

A specimen, and occasionally a variety, of very nearly every species of moth and butterfly (Macro-Lepidoptera old style) occurring in the United Kingdom may be found on the coloured plates. Some of the "Micros" also are depicted (Plates lxv.–lxx.). It would not perhaps have lessened the practical utility of the book if some at least of the latter had not been given. For example, the figures on plate lxvi. are all wrongly named in the text, also in the list of plates and in the index. Twenty-seven species are represented on this plate, and the numbering runs from 1 to 18, then 32 to 40. In the list the numbers for this plate run from 1 to 27, and according to it, and to the text, fig. 1 shows *Botys lupulina*, but this species is really fig. 32 on the plate. Figs. 36 and 37 seem to be *B. ruralis* and *B. lancealis* respectively, but text and list indicate figs. 5 and 6 as these species.

Although very many of the plates are distinctly good, others can only be referred to as medium. On the whole, however, the number of figures that are really unsatisfactory is not excessive.

Turning to the text, we are bound to say that we fail to find very little that will be new to the student of British Lepidoptera. The imago and the larva of each species are more or less briefly described, but we think that variation of the imago, especially of polymorphic species, should have been treated more fully. Distribution, too, is of greater importance, even to the tyro, than our author seems to consider it.

We wonder why *Salmacis* and *Artaxerxes* are set down as species distinct from *Polyommatus alexis*, Scop. (*Lycæna astrarche*), whilst *Cidaria immanata* is figured as a form of *C. truncata* and not even mentioned in the text.

The recent addition to the list of British Lepidoptera—*Anthrocera* (*Zygæna*) *achilleæ*—is figured and described, but we cannot trace anything concerning *Leucania favicolor*, Barr.; we have also looked in vain for *Acidalia humiliata*. *Catocala electa* was possibly rejected as an alien, but some other species accepted by our author—*Plusia chalcitis*, Esp., for instance—are certainly not native in any part of the United Kingdom.

The book is liberally supplied with indexes, and it has a table showing the Systematic Arrangement of Families and Genera. It is well printed and is altogether an attractive volume.

Cornell University. Department of Entomology. Bull. 265. April 1909. "On Certain Seed-infesting Chalcis-flies." By Cyrus R. Crosby.

Treats of the Apple-seed Chalcis (*Syntomaspis druparum*), the Sorbus-seed Megastigmus (*Megastigmus brevicaudis*), the Rose-seed Megastigmus (*M. aculeatus*), the Douglas Fir-seed Chalcis (*M. spermotrophus*), the Grape-seed Chalcis (*Evoxysoma vitis*), and two other species, infesting seeds of the Virginia Creeper and seeds of the Sumac respectively. There are a number of excellent figures in the text.

The following have also been received:—

United States Department of Agriculture. Bureau of Entomology:—

Bulletin No. 64, part vi.: "The Greenhouse Thrips." By H. M. Russell. Part vii.: "New Breeding Records of the Coffee-bean Weevil." By E. S. Tucker.

Bulletin No. 66, part iv.: "The Leaf-hoppers of the Sugar Beet." E. D. Ball, Ph.D. Part v.: "The Semitropical Army Worm." By F. H. Chittenden & H. M. Russell. Part vi.: "The Hop Flea-beetle." By F. H. Chittenden, Sc.D.

Bulletin No. 68, Pl. i. (Revised): "The Pear Thrips." By Dudley Moulton. Part ix.: "The Peach-tree Bark-beetle." By H. F. Wilson.

Bulletin No. 75, part vi.: "The Status of Apiculture in the United States." By E. F. Phillips, Ph.D. Part vii.: "Bee Keeping in Massachusetts." By Burton N. Gates.

Bulletin No. 78: "Economic Loss to the People of the United States through Insects that carry Disease." By L. O. Howard.

Bulletin No. 80, part i.: "The Codling Moth in the Ozarks." By E. L. Jenne. Part ii.: "The Cigar Case-bearer." By A. G. Hammar. Part iii.: "Additional Observations on the Lesser Apple Worm." By S. W. Foster & P. R. Jones, Part iv.: "The Pear Thrips and its Control." By Dudley Moulton.

Bulletin No. 82 part i.: "The Colorado Potato Beetle in Virginia in 1908." By C. H. Popenhoe.

Technical Series, No. 12, part vii.: "The Orange Thrips." By Dudley Moulton. Part viii.: "Biological Studies on Three Species of Aphididæ." By John Juan Davis. Part ix.: "A New Genus of Aleyrodidæ." By A. L. Quaintance.