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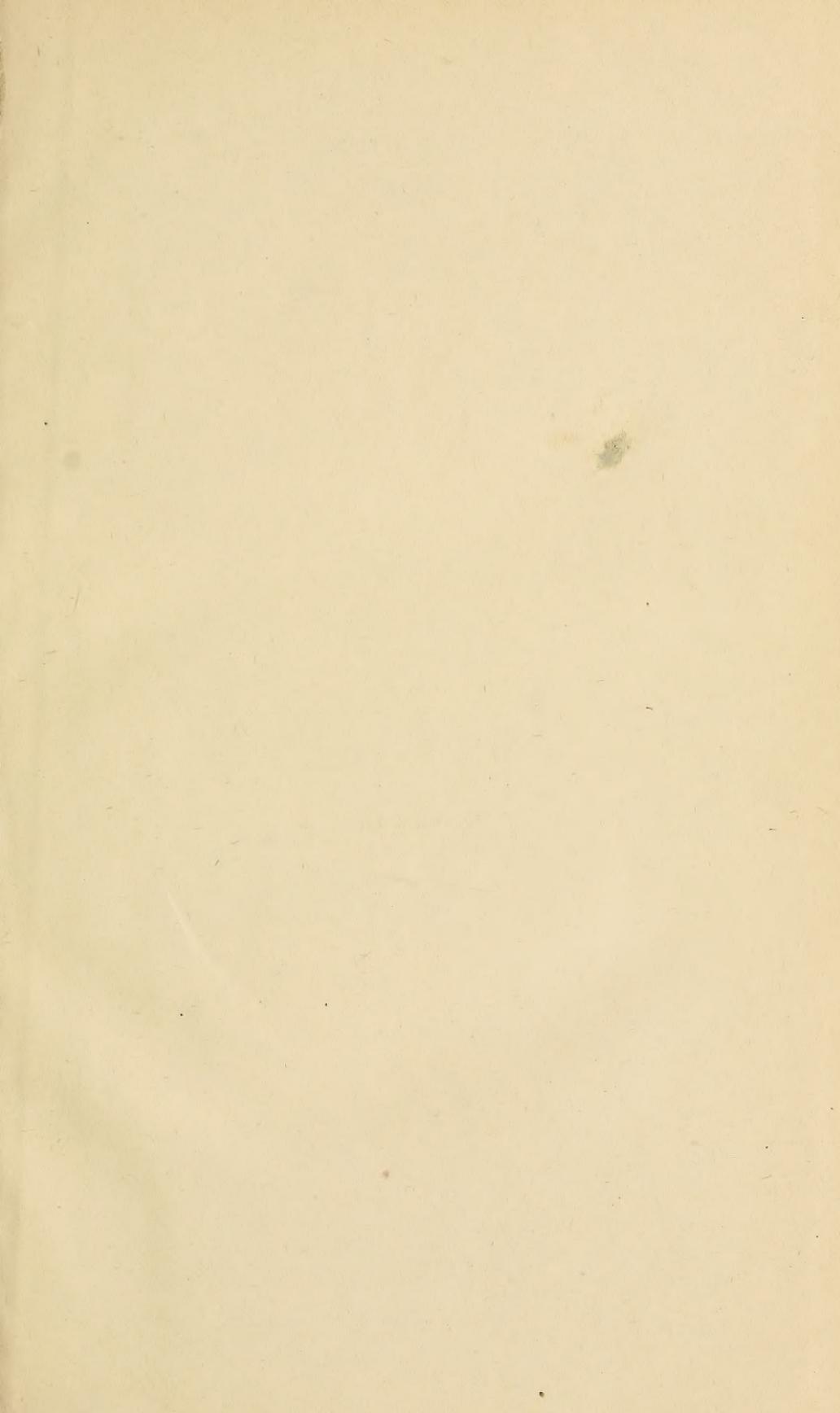
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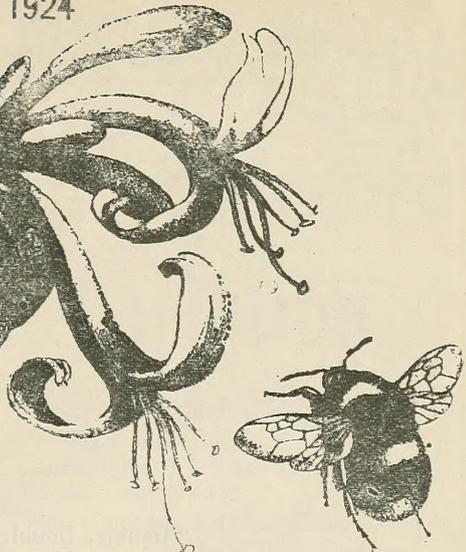
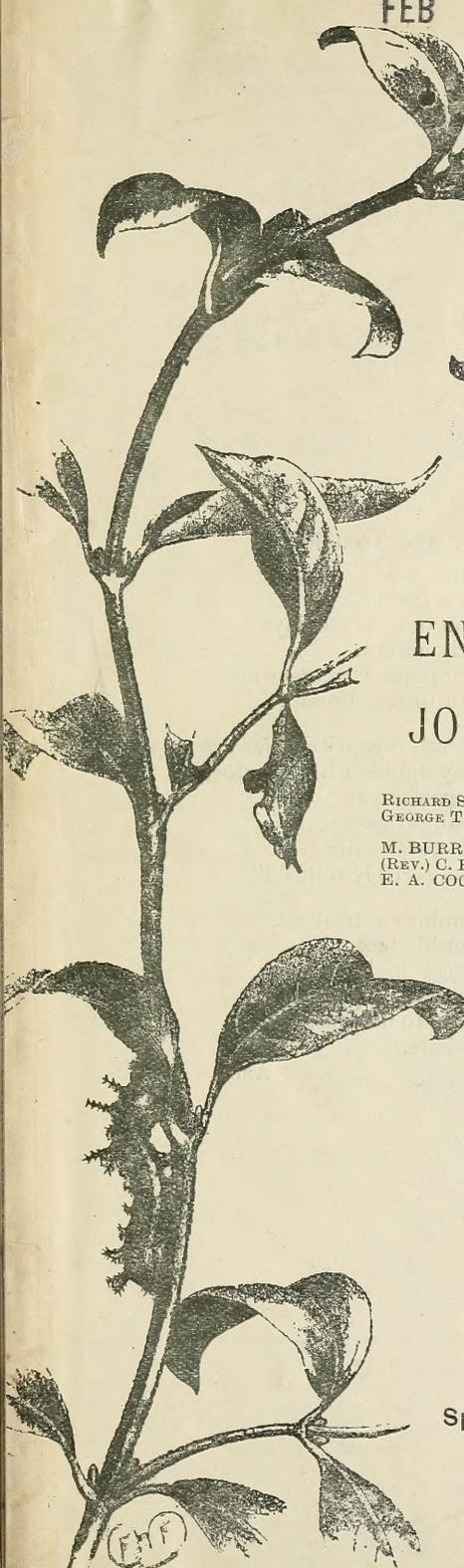






1857

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THE  
ENTOMOLOGIST'S RECORD  
AND  
JOURNAL OF VARIATION

EDITED BY

RICHARD S. BAGNALL, F.L.S., F.E.S.  
GEORGE T. BETHUNE-BAKER,  
F.L.S., F.Z.S., F.E.S.  
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JOHN HARTLEY DURRANT, F.E.S.  
ALFRED SICH, F.E.S.

(REV.) GEORGE WHEELER, M.A., F.E.S.,  
and  
HENRY J. TURNER, F.E.S.,  
Editorial Secretary.

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EMF

**“Double, Double, Toil and Trouble.”**

An ant, a wasp and a bumble-bee  
Were met one day beneath a tree ;  
“ Alas ” said the wasp, “ the wood these days  
Is so very tough I am nearly crazed,  
And they have plastered the posts with creosote  
It has given me such a pain in my throat.”

“ Pooh, pooh ! ” quoth the ant, “ your troubles are mean,  
Why they’ve slaughtered my aphids with nicotine,  
And filled my halls with a poison gas  
So that even our workers cannot pass ;  
Such an horrible odour you never sniffed,  
I’ve a racking cough and am terribly miffed ! ”

The bumble-bee hummed in his contra-bass,  
As he wiped the pollen from his face,  
“ This farmer of mine is exceedingly rude,  
He has cut his clover and starved my brood ! ”  
Then they groaned in chorus, to disappear,  
In the circumjacent atmosphere.

ANON.

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AND

# Journal of Variation

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# The Entomologist's Record

AND

## JOURNAL OF VARIATION.

VOL. XXXV. No. 1.

JANUARY 15TH, 1923.

### Myrmecophilous Notes for 1922.

By H. DONISTHORPE, F.Z.S., F.E.S.

FORMICIDAE.—MYRMICINAE.

*Myrmecina graminicola*, Latr.—The very interesting colony of this species, which I have now had under observation for over twelve years, continues in a flourishing condition. The following is a short extract from the yearly journal kept for this colony during the past twelve months. During the winter the ants kept very quiet and very few deaths occurred. Very little food of any kind was given to them. April 23rd, some bits of raw beef were given, these were cut up by the ants and fed to the larvae: the latter having pellets of the meat placed on their bodies for them to chew at. April 27th, many large larvae present. May 2nd, first packet of eggs observed. May 28th, several packets of eggs, and ♂, ♀, and ♀ pupae. Several ♀ “Daddy-long-legs” given to the ants; their bodies were cut up and devoured, and numerous eggs, taken from them, fed to the larvae. June 11th, fresh packet of eggs, and four winged ♀ ♀ present. June 22nd, very many winged ♀ ♀ and a few ♂ ♂ hatched; many eggs present. July 2nd, still more winged ♀ ♀ hatched. July 9th, the body of a “Magpie-moth” placed in the nest, the ants would have nothing to do with it! This shows how very distasteful the moth must be, as *Myrmecina* is so fond of an insectivorous diet, devouring greedily flies, earwigs, clothes-moths, and other ants, etc. July 24th, some of the winged ♀ ♀ had shed their wings, and this continued until October 29th, when only one ♀ remained with one wing left. The colony is now in a very flourishing condition—a large number of ♀ ♀, still more dealeted ♀ ♀, and many medium and small larvae being present. The outstanding features are that many more winged females, and far fewer ♂ ♂, have been reared than in any single year previously, and the colony was given less food last winter than usual. It is very difficult to draw any safe conclusions from the above as to the reasons for the production of females (*i.e.*, ♀ ♀, not ♀ ♀) at any time in a colony. Professor Emery has expressed the views that ♀ ♀ are only produced from larvae which have been fed with liquid food disgorged into their mouths by the ants, and not by bits of insect and other animal food given to them. Also, that perhaps the most important reason why they are produced is when there is no ♀ in a nest. If I had not read his papers I should have come to the conclusion that this year ♀ ♀ were produced in my colony

by an abundance of animal food (raw beef, etc.) fed to the larvae, after a winter of scarcity. Also in this colony there can never have been the impulse to bring up ♀ ♀ through their absence, as the original ♀, the queen mother of the colony, was present in 1915 when winged ♀ ♀ were first produced, and ever since then the colony has consisted of nearly as many ♀ ♀ as ♂ ♂.

Forel considers that the sex of an ant is already determined in the egg—as is the case with Termites. Space, however, will not allow me to deal with this subject at any further length here; but I hope to return to it in the future.

*Formicoxenus nitidulus*, Nyl.—Mr. H. J. Jeffery, of Newport, Isle of Wight, tells me he has found a colony of this little inquiline ant in a nest of *Formica rufa* in Parkhurst Forest. This is an interesting addition to the ant fauna of the Isle of Wight.

*Solenopsis fugax*, Latr.—Mr. J. H. Keys, of Plymouth, sent me ♂ ♂ and ♀ ♀ of the above species from the Lizard, in Cornwall, to confirm. It is a new county record.

*Stenammas westwoodi*, West.—When working fungi for Coleoptera at "Beechen Corner," in the New Forest, in October, I captured several ♀ ♀ of this ant at the roots of a fungus. The only other record I have of this species from the New Forest is from specimens in the Cambridge Museum Collection, taken by the late Dr. Sharp. Mr. Hallett has also taken this ant in agarics, at Cwrt-yr-ala, in September and October, 1921. Mr. W. E. H. Hodson tells me he has found a number of colonies at Winchmore Hill this year. It will be remembered that the only other actual nests of this species found in the British Isles are those discovered by Mr. R. A. Phillips, in Ireland [*Irish Nat.*, 30, 125-27 (1921)]. The colony given to me by him in September, 1921, has progressed favourably, and not a single ant of the original colony died in the first twelve months I had it under observation. The following is a brief extract from my note book on this colony for 1922. April 25th, the queen laid her first eggs for the year and continued laying throughout the summer. May 28th, a number of semipupae, some pupae and one coloured pupa present. June 5th, a few more coloured pupae present. June 22nd, many light coloured ♀ ♀ (callows) and one ♂ hatched; ♀ ♀ continued to hatch during the summer, and a few callows died. October 10th, I introduced a *Stenammas* ♀, from the New Forest, into this nest; not much notice was taken of it by the ♀ ♀ in the nest. When it approached any of them they backed away from it; it walked over the larvae, and endeavoured to make itself at home. I never saw it attacked and it lived in the nest for two days, but a dead ♀ was present in the light chamber on October 13th, which was probably the New Forest specimen. October 15th, several long Dipterous larvae given to the ants, the ♀ ♀ arranged their own larvae on them in rows, like so many little pigs feeding side by side at a trough.

The colony consists to-day (December 8th) of some 75 ♀ ♀, about 100 larvae, and the queen mother.

*Leptothorax acervorum*, F.—On July 14th ants from a colony of this species were observed coming out of and going in to some beetle burrows high up in an old apple tree in an orchard at Darenth Wood. The burrows were probably old ones of *Scolytus pruni*, which was in evidence in several of the apple trees near at hand.

## DOLICHODERINAE.

*Iridomyrmex humilis*, Mayr.—In March Mr. Keys sent me specimens of an ant to name, which had been taken in houses in Plymouth. These proved to be ♂♂ of the Argentine ant, and from a new British locality. This pest continues the rapid extension of its range. Forel [*Le Monde Social des Fourmis* (1, 1921)] stated it had already been recorded from the centre of France. In my book [*British Ants*, 342, (1915)] I mentioned that it had occurred at Belfast (in great numbers), and in Edinburgh. I have since recorded it from Eastbourne (in great profusion), Enfield, and Guernsey.

## FORMICINAE.

*Acanthomyops* (*Deudrolasius*) *fuliginosus*, Latr.—On May 10th I observed a number of ♀♀ of this species marching in files on and near a large hollow beech at Rhinefields, near the Rhododendron Walk in the New Forest. As I have previously pointed out [*Ent. Rec.* 31, 4 (1919)], this ant is very scarce in this locality, and this is the second time only that I have seen it in the Forest in all the years I have visited there. On May 5th the species occurred rather plentifully in a hedgerow along a bridle-path to Wimbledon Common. This is the first time I have found this ant so near home; the actual nest was not found, but *Ocyropa vittata* was running with the ants.

On July 31st I picked up a winged female on a road at Barkham; no nest nor ♂♂ could be found anywhere near by. She got rid of her wings when placed in a box, and died in two days after she had been taken home and placed in a small plaster nest.

During the seven years I have visited the *fuliginosus* colony established in a birch tree, of which it took possession at Woking on August 27th, 1915, after a fierce battle with a colony of *A. (C.) umbratus* (the original owners), I have taken 35 different species of myrmecophiles in it.

I gave a description of this battle in 1916 [*Ent. Rec.*, 28, 2 (1916)]; and on February 2nd, 1921, I exhibited at the meeting of the Entomological Society of London [*Proc. Ent. Soc. Lond.*, 1921, vii.-ix.] a number of ♀♀ of *A. (D.) fuliginosus*, all of which had ♂♂ of *A. (C.) umbratus* fastened by their mandibles to their legs, etc., from this battle, and 30 species of the myrmecophiles. I stated that it had seemed a good opportunity to note how soon a new nest became infested with myrmecophiles, and consequently I have visited this tree from time to time ever since August, 1915.

The following is a list of the species taken in the order in which they were found, but only the dates of visits are mentioned when an additional species was found:—

Woking, August 27th, 1915.

Battle between *A. (D.) fuliginosus* and *A. (C.) umbratus*.

1. *Myrmedonia lugens* } Running about among the ants. These
2.       "      *cognata* } three species must have followed the
3. *Phyllomyza lasiae* } *fuliginosus*.

May 10th, 1916.

4. *Myrmedonia laticollis*.
5. *Tropidopria fuliginosa* and no. 3 also present.

August 17th, 1917.

6. *Scatopse transversalis* var.  
7. *Amphotis marginata* and no. 2 also present.

March 19th, 1920.

8. *Myrmedonia funesta*.  
9. *Quedius brevis*.  
10. *Microglossa gentilis*.  
11. *Harpactes hombergi*.  
12. *Aphiochaeta aequalis*.  
13. „ *ciliata* and no. 2 also present.

April 4th, 1920.

14. *Myrmedonia limbata* and nos. 2, 8, and 9 also present.

May 30th, 1920.

15. *Oxyypoda vittata*.  
16. *Ptenidium formicetorum*.  
17. *Beckia albina*.  
18. *Limosina curtiventris*.  
19. *Loxotropa fuliginosi*.  
20. *Laelaps (Laelapsis) cuneifer* and nos. 3, 8, 9, 10, and larvae of 9 also present.

June 20th, 1920.

21. *Ptenidium laevigatum* and nos. 3, 9, 10, 12, 13, 14, 15, 16, and pupae of 9 also present.  
22. Chalcid bred from *Quedius brevis* pupa.

August 14th, 1920.

23. *Ceraphron fuliginosi* and nos. 2, 3, 4, 6, 8, 9, and 18 also present.

September 27th, 1920.

24. *Othius myrmecophilus*.  
25. *Spalangia erythromera*.  
26. *Lagynodes niger* var. *aterior*.  
27. *Aspilota nervosa*.  
28. *Tetrilus diversus*. Very young spiders and egg-sacks on carton of nest.  
29. *Quedius mesomelinus*.  
30. Larvae of Dipteron; small but fat and broad. Nos. 2, 3, 4, 8, 9, and 11 also present.

October 7th, 1921.

31. *Oxyypoda haemorrhoea* and nos. 2, 3, 4, 6, 7, 8, 10, 20, 25, 28, 29, and 30 also present.

June 8th, 1922.

32. *Notothecta confusa*.  
33. *Dendrophilus pygmaeus* and nos. 2, 3, 4, 6, 9, 10, 15, 20, and 30 also present.

September 22nd, 1922.

34. *Schizoneura corni*, alate ♀ and nos. 2, 3, 4, 6, 7, 9, 10, 20, 21, 30, and 33 also present.

October 18th, 1922.

35. Proctrupid sp. ?, and no. 15 also present.

In connection with a few species in the above list:—

Nos. 2 & 4 (*Myrmedonia cognata*, Märk, and *M. laticollis*, Märk, are about equally common, and are two of the insects most frequently found present in this nest. This is not generally the case with the the former beetle in *fuliginosus* nests, either as regards to distribution or numbers.

No. 9 (*Quedius brevis*, Er.). On June 8th I brought home some larvae of this beetle and placed them in a cell with some refuse from the nest. One pupated on June 12th and hatched on July 5th, seventeen days being spent in the pupal state.

No. 10 (*Microglossa gentilis*, Märk) was not observed in this nest until March, 1920; since then it has been quite abundant at times. In 1909 I discussed the problem of this (and other) species inhabiting both birds' nests and ants' nests (*Trans. Ent. Soc. Lond.*) 1909 398-402).

No. 21 [*Ptenidium (Matthewsium) laevigatum*, Er.] has been found twice. I have little doubt that this is a myrmecophilous species. It has occurred with both *Formica rufa* and *A. (D.) fuliginosus* elsewhere. One of the four specimens in the Matthews' Collection was originally in his series of *P. formicetorum*, and marked by him as being a typical specimen of the latter species, he having no doubt taken it with ants. Many of the British records of *P. laevigatum* are probably erroneous.

No. 25 (*Spalangia erythromera*, Först.) I have bred this year from pupae from No. 30; this is a new host for the Chalcid. It will be remembered that when I first discovered a host for this insect, I bred it from pupae of *Phylomyza lasiae*. [For notes on the life-history, etc., of *S. erythromera* see *Ent. Rec.* 34 4 (1922)].

No. 30. I have not so far been successful in breeding the imagos from these larvae, though I have frequently brought examples home and placed them in cells with bits of carton and refuse from the nest and damp earth. They always pupate, some fastening themselves on bits of the carton, but no flies have ever hatched out. These larvae are chiefly to be found in the earth, often very damp, immediately beneath the carton of the ants' nest. I have found Dipterous eggs, from which the larvae had emerged, attached to the carton of the nest, which I have thought might be those of this species.

No 33. *Dendrophilus pygmaeus*, L. This is the first time, as far as I am aware, that this *Formica rufa* guest has ever been taken in a nest of *A. (D.) fuliginosus*. As a second specimen occurred on September 22nd, it is not the case of a single chance specimen.

The carton of the nest is of a light brown colour. I keep the hole in the tree packed with grass, etc., in the usual manner, and of course various species of non-myrmecophilous Coleoptera, etc., are often found, such as *Aleochara succicola*, Th., *Atheta nigricornis*, Th., *Xantholinus linearis*, Ol., *Clambus punctulum*, Beck., *Hister merdarius*, Hoff., *Euplectus karsteni*, Reich., *Coninomus constrictus*, Gyll., *Corticaria denticulata*, Gyll., and *C. eppelsheimi*, Reitt., etc. I think that the reason that the *fuliginosus* have not deserted their nest, which ants will frequently do when continually disturbed, is that I generally give

them some sugar when I repack the nest. Mr. Champion also occasionally visits this nest, and he kindly informs me what species of Coleoptera he finds present. I am indebted to him for the first record of No. 14 (*Myrmedonia limbata*, Pk.); he also found No. 32 (*Notothecta confusa*, Mk.) there this year, and *Queëius ventralis*, Ahr.

*Acanthomyops (Donisthorpea) niger*, L.—On August 20th marriage flights of this ant took place both at Putney (noted by Miss F. Kirk), and at Horsford in Norfolk, where I was at the time. In the latter locality the sexes of *A. (C.) flavus*, and species of *Myrmica* were also on the wing. Another flight occurred at Putney, on September 21st, all over the district, at about 5.30 p.m. Sparrows were catching the winged ants both on the ground and in the air, and a large green dragon-fly was "hawking" them; flying up and down the Hazlewell Road.

*Acanthomyops (Chthonolasius) umbratus*, Nyl.—When evening sweeping at Barton Mills on September 5th, numerous ♂♂ and winged ♀♀ of this species were swept up off long grass, and were very active in the net. On September 22nd when evening sweeping at Woking, a single winged ♀ was netted. On being placed in a glass-topped-box she immediately got rid of her wings.

*Formica rufa*, L.—On May 9th a single winged ♀ was seen running in a sand-pit near Lyndhurst, New Forest, a marriage flight having no doubt taken place that morning, the day being hot and sunny. On June 6th at Woking a deälated ♀ was picked up as she was crossing a foot path. This I took home and endeavoured to get accepted by some *F. picea* ♂♂ from the New Forest. The experiment was not successful however; as she died (or was killed) in a few days.

*Formica picea*, Nyl.—On May 7th ♂♂ of this ant were running about all over the "picea" area in Matley Bog. Several nests were located; the colony from one of these, which contained no less than 15 deälated ♀♀, was taken home and fitted up in a plaster nest. The ants were evidently not at home in the plaster nest; and the colony did not thrive, though eggs were laid and larvae brought up. Amongst other food given to this nest was a number of *F. rufa* ♂ éocoons, some of which were cut open and the *rufa* pupæ devoured; others were allowed to hatch and the *rufa* ♂ lived for some time in the *picea* colony. Latterly they were sometimes pulled about by the *picea* ♂♂, and all eventually died. I have presented the individuals which remained of the colony to Miss Cheesman of the Zoological Gardens, as she had prepared a formicarium in the Insect House, consisting of a bog with growing sphagnum, rushes, etc., for their reception. She tells me that they all went down into the sphagnum at once on arrival; but have not appeared since. It remains to be seen if the ♀♀ will lay eggs, and the ♂♂ build up a typical *picea* nest next year.

*Camponotus (Camponotus) herculeanus*, L., subsp. *pennsylvanicus*, Rétz.—Mr. J. W. Saunt sent me to name a number of ants comprising ♂♂, winged ♀♀, ♀♀, and ♂♂, which proved to belong to the above subspecies. He told me that about July 7th he noticed a large deälated ♀ ant on the floor of a saw-mill at Coventry, which he realised was not a British species. On hunting about he found a plank of American oak which had been bored by Coleopterous, or Lepidopterous, larvae, and on cutting off a piece a hole was exposed which was

tightly packed with dead ants. After shaking out and removing with tweezers a large number of these, the entrances to a central chamber were exposed, and inside he discovered five live winged ♀♀. Of course these ants had been introduced in timber from North America; but how, and why, they came to be packed into the small space in which they occurred (Mr. Saunt kindly sent me the piece of oak and I should say the borings were Coleopterous) I am quite unable to explain. In *British Ants* (p. 348) I give other records of this American species occurring in Britain. Winged ♀♀ were also sent to the Museum (a year or two back), from Alfreton, Derbyshire, which had been imported from America in ash poles.

#### COLEOPTERA.

*Atemeles emarginatus*, F.—A specimen of this insect was found running at large in a sand-pit at Matley Passage, New Forest, on May 15th. A few *Myrmicas* were about in the sand-pit; the beetle had probably just left a *Myrmica* nest, preparatory to entering one of *Formica fusca*.

*Clythra 4-punctata*, L.—A number of specimens were observed seated on brambles over a *rufa* nest in Ramnor Inclosure, New Forest, on May 11th. One pair, *in cop.*, was quite close to the nest on a twig, and ants were continually running over them, apparently without disturbing them in any way.

#### BRACONIDÆ.

*Aspilota concolor*, Nees.—Mr. Morley has kindly named for me a ♂ of this species which I took in a nest of *Formica fusca* at Box Hill on May 1st, 1910. I have several times taken *Aspilota nervosa*, Hal., in the nest of *A. (D.) fuliginosus*. Mr. Morley tells me that this genus is parasitic on Diptera; it is therefore certain that when found with ants, they are parasitic on the flies which have bred in the ants' nests.

#### DIPTERA.

*Microdon rhenanus*, Andries, and *M. latifrons*, Lw.?—On May 6th I found one larva and a few empty pupa cases of a *Microdon* in a nest of *A. (D.) niger* situated in a stump of Scots pine in the New Forest. The larva was unfortunately injured when breaking up the stump with a digger, and as it died next day, it was placed in spirit. On May 11th I again visited the ride where the stump had occurred, to endeavour to obtain more specimens. A number of old, empty *Microdon* pupa cases were found in various pine stumps containing *niger* colonies (proving that the flies had been abundant last year), but neither larvae, nor live pupae, were seen. As the pupa cases were different from any I had previously seen I sent some to Father Wasmann, who informed me they were *Microdon rhenanus*, Andries, a rare species and new to Britain. He also kindly supplied me with the reference to the original description [*Zeits. f. Wissen. Zool.* ciii, Heft 2 (1912)]. I subsequently gave a pupa case to Mr. Edwards for the Museum, with the reference, and he informs me that it does not agree with the description of *M. rhenanus*, and moreover he is of the opinion that it is that of *M. latifrons*. As I found *Microdon* puparia in several different stumps, they may not all belong to the same species, and it

is most probable that those sent to Wasmann are *M. rhenanus*.\* Of the others however I can only say that they do not appear to me to agree with one of *M. latifrons*, taken by Mr. Champion at Woking, which I have before me. The latter is distinctly larger, the ground surface is smoother, and the raised reticulated pattern is neither so prominent, nor so pronounced; moreover the shape is different, being more parallelsided, and not as narrowed towards the base.

*Microdon latifrons*, Lw., was taken in Britain in 1875, at Oxshott, and in 1900 at Nethy Bridge, by Colonel Yerbury; and by the late Rev. H. S. Gorham, in the New Forest, in 1902: but these I believe were only specimens of the imago netted at large. Quite recently Mr. Champion found live pupae at Woking in ants nests under pine bark, and Mr. Main at Ascot, from which the flies were reared. It is unfortunate that I was not put on to these localities in time to ascertain the host ant of the fly, which host, as far as I know, is unknown on the Continent.

As is well known, the larvae of all species of *Microdon* occur in many parts of the world, but always in ants' nests, where they pupate; and have been known for many years. The food, however, on which they lived was unknown, and it had never been discovered until 1912. Unfortunately Forel, in his last volume [*Le Monde Social des Fourmis du Globe*, 2, 118 (1922)], states that it is still unknown. In 1912 [*Ent. Rec.*, 24, 35-6 (1912)] I demonstrated by experiment of what the food of these larvae consisted. It may be as well to recapitulate briefly what I then wrote concerning one from a number of the larvae of *Microdon mutabilis* taken in nests of *Formica fusca*, at Porlock, and introduced into a plaster nest containing a colony of that ant—"The smallest larva I had is now full grown and still alive to-day, December 23rd, it having lived in my nest for over seven months." [It subsequently pupated and hatched.] "It is always in the chamber occupied by the ants. When they move it very slowly follows them. The ants often sit on it and walk over it, but they never feed it. In my former experiments [*Ent. Rec.*, 19, 255 (1907): 21, 18-19 (1909)], I kept the ants and larvae in a bowl with earth, and as the ants and the *Microdon* larvae were always beneath the earth, I could never see them without disturbing the nest. Now I have been able constantly to observe them, it is quite clear that the food of the larva consists of the droppings, and pellets (Janet's *Boulettes de nettoyage*), of the ants. It has never had any other food in the bare chamber in which it lives, it has never gone to the honey which is in the last (the light) chamber, the ants have never fed it, and it has grown to a full size larva from a very tiny young one."

#### HETEROPTERA.

*Nabis lativentris*, Boh.—Examples of the larva of this bug were observed in company with ♂ ♀ of *Formica fusca*, and *F. fusca* var. *glebaria*, on the cliffs at Ventnor, I. of W., on September 9th. Mr. G. C. Leman and his son also found young stages of *N. lativentris* running about with ♂ ♀ of *F. fusca* at Southwold in August. On both of the above occasions the bugs were about the same size as the

\* Since this was written I have heard again from Father Wasmann and he tells me the specimens sent to him are *M. rhenanus*.

ants. Other records of the occurrence of the larva of this *Nabis* with ants may be found in the *Ent. Mo. Mag.* for June, 1921 [*E.M.M.* 57 187 (1921)].

#### APHIDIDAE.

*Trama troglodytes*, Heyden.—Specimens were found at large in a nest of *A. (D.) niger* under a stone at Freckenham, on September 5th. As usual when the nest was exposed the ants carried the Aphids into safety.

*Aphis heraclei*, Koch.—Many specimens occurred in a nest of *Myrmica ruginodis* at the roots of *Heracleum sphondylium* at Stowting, on June 30th. *Forda formicaria* was found in company with the Coccid *Ripersia subterranea* in a nest of *A. (D.) niger* under a large stone on the beach at Ventnor, I. of W., on September 11th.

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### Lepidopterology.

In the recently issued Trimestres of the *Annales de la Société Entomologique de France* the illustrious Abbé J. de Joannis has written a critical revision of the species of Lepidoptera whose larval stage produce or inhabit galls on plants in the European area. He has taken as the basis of his paper the great work of Houard, *Catalogue des Zoocécidies des Plantes d'Europe et du Bassin de la Méditerranée*, treating of each species in detail and finally showing that out of the 62 species of Lepidoptera recorded by Houard 12 should be deleted as included upon incomplete or erroneous original and unconfirmed observations, while at the same time M. de Joannis adds 12 European species, which are not included in the original work of Houard.

These 62 species are divided among the families *Sesiidae* 3, *Pyralidae* 1, *Pterophoridae* 2, *Orneodidae* 4, *Tortricidae* 24, *Hyponomeutidae* 1, *Gelechiidae* 15, *Elachistidae* 9, *Nepticulidae* 2, *Tineidae* 1.

The Abbé's remarks and criticisms are written in a most kindly manner with ample apologies to the author for having to point out such a series of errors both of commission and omission. He quotes with much apparent pleasure, and as an incentive for future observers the words of the late Lord Walsingham in vol. xl. of the *Ent. Mo. Mag.*: "One finds here [Biskra, Algeria] among the *Micros* an unusual proportion of gall-makers. This habit is adopted by at least seven distinct genera:—*Phalonia*, *Oecocecis*, *Coleophora*, and four new ones (*Anoecis*, *Cecidophaga*, *Hypoecis* and *Proactica*). I am able to record nine gall-making species in these genera without taking account of *Amblypalpis olivierella*, Rgt., the galls of which I believe I also found on *Tamarix*, and two others, not yet bred, one on *Gymnocarpon fruticosum*, possibly an inquiline, and one on *Haloxylon articulatum*."

The following are the species given as "cécidogènes" by the Abbé Joannis with the host plant, those marked with an asterisk being found in Britain:—

\**Sciapteron tabaniformis*, Rott., on poplars (*Populus nigra*, *alba*, etc.); var. *rhingiaeformis*, Hb., on *P. nigra*; and subsp. *synagriformis*, Ramb., on *P. alba*, etc.

*Sesia flaviventris*, Stdgr., on willows (*Salix caprea*, etc.).

*S. triannuliformis*, Frr., on Sorrel (*Rumex acetosella*).

\**Odontia dentalis*, Schiff., on *Echium vulgare* and *Anchusa* sp.

*Platyptilia nemoralis*, Z., on groundsels (*Senecio nemoralis*, *silvaticus*, etc.); var. *sarracenicæ*, Wk., on *S. fluviatilis*.

\**Pterophorus microdactylus*, on Hemp Agrimony (*Eupatorium cannabinum*).

*Orneodes desmodactyla*, Z., on *Stachys* sp.

*O. dodecadactyla*, Hb., on Honeysuckles (*Lonicera xylosteum*, *caerulea*).

*O. grammodactyla*, Z., on Scabious species (*Scabiosa columbaria*, *maritima*, etc.).

*O. palodactyla*, Z., var. *perittodactyla*, Stdgr., on *Scabiosa urceolata*.

\**Tortrix paleana*, Hb., on *Plantago lanceolata*.

\**Conchylis atricapitana*, Steph., on *Senecio jacobaea*.

*C. pontana*, Stdgr., on the wormwoods (*Artemisia campestris*, etc.).

*C. corsicana*, Wlsm., on *Santolina chamaecyparissus*.

*C. austriana*, Chrét., on *S. rosmarinifolia*; var. *florana*, Chrét., on *S. chamaecyparissus*.

*C. hyllarana*, H.-S., on *Artemisia campestris*.

*C. clarana*, Cst., on *Artemisia gallica*.

*C. santolinana*, Stgr., on *Santolina rosmarinifolia*.

*C. catensana*, Stgr., on *Artemisia barrelieri*.

*Conchylis leucanthana*, Cst., on *Cephalaria leucantha*.

\**Evetria buoliana*, Schiff., on pine trees (*Pinus sylvestris*).

\**E. resinella*, L., on pine trees (*Pinus sylvestris*, *montana*, etc.).

\**Gypsonoma aceriana*, Dup., on poplars (*Populus alba*, *nigra*, etc.).

\**G. incarnana*, Haw., race *dealbana*, Frr.

*Pelatea festivana*, Hb., on oak (*Quercus pubescens*).

*Semasia metzneriana*, Tr., on *Artemisia absinthium*.

*S. incana*, Z., on *Artemisia campestris*.

*Epiblema lacteana*, Tr., on *Artemisia campestris*.

\**E. tetraquetra*, Haw., on alders and birches (*Alnus glutinosa*, etc., and *Betula pubescens*, etc.).

\**E. luctuosana*, Dup., on Centaury (*Centaurea nemoralis*).

*Grapholitha zebeana*, Rtzbg., on larch (*Larix europaea*).

\**G. servillana*, Dup., on willows (*Salix caprea*, *viminalis*, *cinerea*, *repens*, etc.).

*G. conicolana*, Heyl., on pines (*Pinus sylvestris*, *laricio*, etc.).

\**Argyresthia goedartella*, L., on alder (*Alnus glutinosa*).

*Parapodia sinaica*, Frauent., on Tamarisk (*Tamarix gallica*, etc.).

\**Gelechia mulinella*, Z., on *Bartsia aspersa*.

*Phloeocecis cherygella*, Chrét., on *Fagonia sinaica* and *F. glutinosa*.

*Lita gallincolella* Mn., on Tamarisk sp.

*L. gypsella*, Cst., on *Aster acris*.

*L. cauligenella*, Schmid., onampions (*Silene inflata*, *nutans*, *italica*, etc.).

*L. gypsophylæ*, Stt., on *Gypsophila* sps.

*L. coussonella*, Chrét., on *Silene saxifraga*.

*Teleia brucinella*, Mn., on Tamarisk.

\**Stenolechia gemmella*, L., on oak (*Quercus sessiliflora*).

*Proactia halimilignella*, Wlsm., on *Atriplex halimus*.

*P. echiochilonella*, Chrét., on *Echiocylon fruticosum*.

*Sclerocecis pulverosella*, Chrét., on *Limoniastrum guyonianum*, etc.

*Amblypalpis olivierella*, Rag., on Tamarisk sps. (*Tamarix jordania*, *articulata*, etc.).

- \**Blastodacna vinolentella*, H.-S., on crab-apple (*Pyrus malus*).
- \**Mompha decorella*, Steph., on willow-herbs (*Epilobium hirsutum*, *montanum*, *parviflorum*, *angustifolium*, etc.).
- M. nodicolella*, Fuchs., on *Epilobium montanum* and *angustifolium*.
- Stigmatophora serratella*, Tr., on snapdragon (*Antirrhinum majus*).
- S. teucris*, Wlsm., on *Teucrium fruticans*.
- \**Agasma aeratella*, Z., on the bistorts (*Polygonum aviculare*, *arenarium*, etc.).
- \**Heliozela stanneella*, F.R., on oaks (*Quercus pedunculata*, *cerris*, *lusitanica*, etc.).
- Coleophora stefanii*, Joann., on goosefoot species (*Atriplex parviflorus*, etc.).
- Phyllobrostis eremitella*, Joann., on spurge laurel (*Daphne gnidium*).
- Nepticula turbidella*, Z., on white poplar (*Populus alba*).
- \**N. argyropeza*, Z., on aspen (*Populus tremula*).
- \**Incurvaria tenuicornis*, Stt., on birch (*Betula alba*).—H.J.T.

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### Notes on Coccinellidæ.

By G. B. C. LEMAN, F.E.S.

1. *Hippodamia variegata*, Goeze, ab. SUBARCUATA, mihi. While collecting aberrations of this species in the summer of 1922 at Southwold, Suffolk, I found one with a formula not yet recorded.

This aberration is distinguished from ab. *arcuata*, Leman, in having the confluence inverted and its formula is 1, 2, 3, 5+4+6,  $\frac{1}{2}$ . Type in my collection.

2. I found this species in fair numbers on nettles and the coarse tall grass typical on the beach in this district. The type form with 9 spots largely predominated, followed by ab. *constellata*, Laich., ab. *angulosa*, Ws., and ab. *similis*, Schrank (13 spots). The following were found in much lesser ratio, viz.: ab. *neglecta*, Ws., ab. *confluens*, Sajo, ab. *velox*, Ws., ab. *11-punctata*, Schrank, and ab. *abbreviata*, Ws. Of each of the following I only took one specimen: ab. *donistorpei*, Leman, ab. *julii*, Leman, ab. *italica*, Walt., ab. *alacris*, Ws., and ab. *observepunctata*, Schrank.

3. Of the above forms I do not think abs. *confluens*, *velox*, *11-punctata*, *abbreviata*, *julii*, *italica* and *alacris* have been recorded for Great Britain, though probably they may be found in many collections.

4. I took three specimens approaching ab. *donistorpei*, Leman, to the extent that in two cases the left and right elytra respectively only have the typical confluence, while in the third case the left elytron has the typical confluence and the right elytron conforms to the formula of the type form (9 spots).

5. One specimen of ab. *angulosa*, Ws., is remarkable for the boldness and breadth of the spots forming the confluence.

6. Out of some 200 specimens taken, only three (the typical form, ab. *constellata*, Laich., and ab. *similis*, Schrank) have the coronate form of marks on the thorax.

7. *Halysia 22-punctata*, L.—At the same time I took this species in large numbers, not on nettles as I had expected, but on young oak shoots springing up from stumps of fallen trees, all in the length of one hedgerow. Incidentally these shoots were all attacked by the whitish mildew so often seen on young oaks. I took the species in all

its stages and had not taken the larva or pupa before. These latter are readily distinguished from those of other Coccinellids by their distinct yellowish appearance. I brought back several of the larvae, which in due course pupated and emerged satisfactorily.

### Some Notes on Swiss Butterflies.

[Supplementary to the *Butterflies of Switzerland*, by Rev. Geo. Wheeler, M.A., F.E.S.]

By the late MR. A. J. FISON.

(Arranged and communicated by Miss L. M. FISON.)

"The works of the Lord are great, sought out of all them that have pleasure therein."—*Psalm*, cxi. 2.

(Concluded from vol. xxxiv., page 217.)

*Epinephele lycaon*, Rott.—Fionnay, vii.; Nessel, 30.vii.90; Derborence, 25.viii.90.

*Aphantopus hyperantus*, L.—Rhone Bridge of St. Triphon, 21.viii.03 (lots); Charpigny, 3.viii.88; Gryonne, 22.vii.22; Champéry, 31.vii.22; Mt. Carré, vi. and viii.; Dent du Midi.

*A. hyperantus* ab. *arete*, Milliére.—Above Plan Cerisier; Martigny Combe.

*A. hyperantus* ab. *caeca*, Fuchs.—Corbeyrier; Éclépens.

*Coenonympha iphis*, Schiff.—Bex; Montet, 15.vi.20; Gryonne Meadows, 1.vii.22; Charpigny, 3.vii.22; St. Triphon Marsb, 3.vii.22; Dent du Midi, 4.vii.22; Mont Carré, 21.vi.

*C. arcania*, L., var. *insubrica*, Rätzer.—Le Prese, 13.vii.01; Faido, 13.vii.03 (1).

*C. arcania* var. *darwiniana*, Stdgr.—Bel Alp, 14.vi.90; Caux, vi.

*C. satyrion*, Esp.—Dent du Midi; Barmaz; Bonaveau, 8.viii.22 (L.M.F.), very small spots, some none.

*C. satyrion*, Esp., var. *unicolor*, Wh.—Mortersatsch Glacier, 19.vii.01; Émosson; Col de Forclaz, 7.viii.09; Teméley, 2.viii.10. No black spots on band.

*C. satyrion* ab. *caeca*, Wh.—(1) Rigi Staffelhöhe, 21.vi.04.

*C. pamphilus* var. *lyllus*, Esp.—Mt. Bré; Cassarate; Mendrisio, 15.viii.02.

*C. tiphon*, Rott.—Altmatt, 17.vii.03; Arth-Goldau, 20.vi.04; Einsiedeln, 6.vii.04; Aigle beyond golf links by Canal, 16.vi.05, S.E. corner, the best part. The forms found there are very interesting, some being dark and some pale. Leeuk, 19.vii.07.

*Oeneis aëlle*, Hb.—Saasgrund, 29.vi.94; under mountains from Vernayaz to Martigny, no doubt blown down. Laquinthal, 18.vii.08; under Dent de Morcles, 25.vi.90; Faulhorn, 1.viii.14 (L.M.F.).

*Erebia epiphron*, Knoch., var. *cassiope*, Fabr.—Under Bel Alp, 14.vii.90.

*E. epiphron* ab. *nelamus*, Bdv.—Furka; Trübsee; Zermatt; Simplon; St. Bernard; Glacier du Trient.

*E. epiphron* var. *valesiana*, Mey.D.—Pierre-à-Voir; Mägenwald.

*E. melampus*, Fssl., ab. *sudetica*, Stgr.—Randa; (1) Prätigau.

*E. flavofasciata*, Heyne.—Schafberg, S. of 1st Restaurant, 1-15.vii.04; Tscherva glacier, 30 mins. below and behind Restaurant, 1 ♂, 10.vii.01; none there in 1904; first found about 1850. Now on S. side of Albrun Pass.

*E. eriphyle*, Frr.—St. Lucia, 30.vii.97.

*E. pharte*, Hb., ab. *phartina*, Stgr.—Anthémoz, 29.vii.02.

*E. mnestra*, Hb.—Boden Glacier, 18.vii.95.

*E. alecto*, Hb., var. *glacialis*, Esp.—Fully; Portailles; Vernayaz, 18.vii.91; Mattmark See, 29.vi.94; Faulhorn, 1.viii.14 (L.M.F.); Anzeindaz, 14.vii.91.

*E. manto*, Esp.—Dischmathal (near *eriphyle* locality), 11.vii.04; Fénistral Bridge, 4.viii.10; Chamossaire; Corbeyrier; Rochers de Naye; varies greatly in size.

*E. manto*, Esp., ab. *caecilia*, Hb.—Trient glacier.

*E. ceto*, Hb.—Belalp, 14.vii.90; Teméley, 8.viii.1900.

*E. medusa*, Fabr.—With extra eye at apex of forewing (on one side only) like ab. *erivades*, Wh. Found 1 in 50 so at Charpigny; and on the West side of Gryonne between road and railway in May, 1906, I got about 15 so. ♀s seem to have this eye at times. (18) Éclepens (marsh), 20.v.90; Belalp, 14.vii.90; Monte Bré, 28.v.03; Caux, 18.vi.03; Faïdo, 11.vi.04; (3) Charpigny, 8.vi.07.

*E. oeme*, Hb.—Maderanerthal, 24.vi.96; Faulhorn, 1.viii.14; Dent du Midi, 29.vi.14, with var. *valesiaca*, Elwes; Lutschine Valley, 3.viii.14; Champéry, 31.vii.22; Barmaz, 4.viii.22 (L.M.F.).

*E. erias*, Godt.—Losone (1), 23.v.03; Asegna, 4.v.96; above Inden, 4.vi.94; Dent de Morcles (2/3 up), 15.v.94.

*E. nerine*, Frr., var. *stelviana*, Curó.—Under Piz Languard (near 1st and 2nd snow), vii.04; Täschthal, 9.vii.95.

*E. euryale*, Esp.—Émaney, 13.viii.09.

*E. ligea*, L.—Dent du Midi, 29.vi.14—21.vii.22; Gorge de Chauderon; E. of Niouc, vii.; Frenières, 3.vii.13; Grindelwald, viii.14; Champéry, 30.vii.22 (L.M.F.).

*E. aethiops*, Esp.—Charpigny, viii.

*E. aethiops* ab. *leucotaenia*, Stgr.—Alpe de Bodine.

*Erebia pronöe*, Esp., var. *pitho*, Hb.—Salanfe Road above Salvan, 3.ix.10.

*E. goante*, Esp.—Émosson (Finbaut), 12.viii.09; sous Kippel, 10.viii.90; Faulhorn, 1.viii.14 (L.M.F.).

*E. gorge*, Esp.—Rothhorn nr. Brienz, 16.vii.92; Mattmark See, 29.vi.94; Anzeindaz, 14.vii.91; Gornergrat, 5.vi.97.

*E. tyndarus*, Esp.—Faulhorn, 1.viii.14; Barmaz, 4.viii.22 (L.M.F.).

*E. tyndarus* var. *dromus*, H.S.—Nr. Anthémoz, 4.viii.03; Barmaz, 1.viii.03.

*E. lappona*, Esp.—Arpilles, nr. Martigny (2082 m.) (4), 9.vi.90; Faulhorn, 1.viii.14 (L.M.F.).

*Melanargia galathea*, L.—Charpigny, vi.; Les Posses; nr. Gryonne at Bex. Some with blue spots at edge of W. Sierre, 8.vii.02; Bué, 3.vii.01; Bex, 8.vi.03.

*M. galathea* var. *galaxaera*, Esp.—Lavorgo, 9.vii.03; Mt. Bré, 28.v.03 and 18.viii.02; (24) Lugano, 2.vi.96.

## NOTES ON COLLECTING, etc.

WARWICKSHIRE RECORDS OF ICHNEUMONIDAE (ICHNEUMONINAE).—Considering the meagre reports of *Ichneumonidae* from the Midlands, perhaps the following captures in the Coventry district will be of

interest to readers. These were all taken previous to 1922 and have all been determined by Claude Morley, F.Z.S., F.E.S.:—*Protichneumon laminatorius*, F.—Bubbenhall, 30.vi.18, H. Cooke. *Stenichneumon trilineatus*, Gm.—Earlsdon, 1921, A. J. Aiers. *S. ochropis*, Gm.—Stockton, 12.vii.19. *Cratichneumon rufifrons*, Gr.—Stoke, vi.16; Coleshill Bog, 23.vi.1917; Stoke, 29. v. 21. *C. fabricator*, Fab.—Common and generally distributed. *C. annulator*, Fab.—Common and generally distributed. *C. fugitivus*, Gr.—Bubbenhall, 31.viii.19; Stoke, 28.v.21. *C. gravenhorsti*, Fnsc.—Coombe, 14.ix.16; Bubbenhall, 11.v.19; 25.iv.20; Kenilworth, 8.viii.20. *C. lanus*, Gr.—Coleshill, 23.vi.17. *Melanichneumon leucomelas*, Gm.—Stoke, 18.viii.17; Bubbenhall, 18.vi.18. *M. saturatorius*, L.—♀ Stoke, 1916. *Barichneumon genellus*, Gr.—Church Lawford, 27.vii.19. *B. ridibundus*, Gr.—Coombe, 15.viii.20; Stoke, 8.viii.21. *B. albicinctus*, Gr.—Bubbenhall, 17.viii.19. *B. bilunulatus*, Gr.—Ryton, 6.vi.20; Brinklow, 12.ix.20. *B. vestigator*, Wesm.—Kenilworth, 8.viii.20. *Ichneumon deliratorius*, L.—Generally distributed. *I. sarcitorius*, L.—Bubbenhall, 17.ix.17; Cubbington, 7.viii.18; Canley, 14.v.19; H. Cooke. Bubbenhall, 3.vii.21; F. Bonham. *I. latrator*, Fab.—Coombe, 15.viii.20. *I. molitorius*, Gr.—Stoke, 9.vii.20. *I. extensorius*, L.—Common and generally distributed. *I. gracilentus*, Wesm.—Bubbenhall, 17.vii.17; Hunningham, 6.viii.19; Canley, 29.v.20. *I. confusorius*, Gr.—Common and generally distributed. *I. albiger*, Wesm.—Bubbenhall, 20.viii.17; 13.ii.21; Baldwin. *I. gracilicornis*, Gr.—Brinklow, 2.viii.20. *Euxephanes hilaris*, Gr.—Coombe, 15.viii.20. Rare. *Chasmias notatorius*, Fab.—Brinklow, 12.ix.20; Brandon, 7.ix.21. *Ctenichneumon castigator*, Fab.—Coventry, 20.vi.21. *C. funereus*, Fre.—Coombe, 7.viii.21. Rare. *C. divisorius*, Gr.—Ryton, 10.vi.17. *Spilichneumon occisorius*, Fab.—Stoke, 21.viii.20. *Amblyteles subsericans*, Gr.—Bubbenhall, 8.vi.18; Coe, ♂ ♂, 15.viii.20; Ryton, 31.vii.21; Brandon, 7.ix.21. *A. armatorius*, Fst.—Generally distributed. *Probolus alticola*, Gr.—Stoke, v.16 ♂. *Eurylabus larvatus*, Chr.—Bubbenhall, 25.viii.17. Rare. *Platylabus pedatorius*, Fab.—Binley, 2.x.21. *P. phaleratus*, Hal.—Stoke, 11.vii.20, H. Cooke. Very rare. *Herpestomus brunneicornis*, Gr.—Bubbenhall, 1.ix.18; H. G. Wagstaff. *Phaeogenes stipator*, Wesm.—Binley, 2.x.21. Rare. *P. planifrons*, Wesm.—Stoke, 24.v.20; Coombe, 15.viii.20. *P. impiger*, Wesm.—Princethorpe, 26.vii.19. *P. maculicornis*, Ste.—Cubbington, 7.viii.18; Coventry, 15.v.19; Church Lawford, 27.viii.19; Stoke, 8.viii.21. *P. stimulator*, Gr.—Brandon, 1.vi.19; Coombe, 7.vi.19; Bubbenhall, 25.iv.20; Brandon, 11.vii.20. *P. callopus*, Wesm.—Ryton, 6.vii.20. *P. fulvitaris*, Wesm.—Brinklow, 27.vi.19. *Diadromus troglodytes*, Gr.—Stoke, 9.vii.20. *Hemichneumon elongatus*, Rtz.—Stoke, 19; Smockington, 7.viii.20. Rare. *Alomyia debellator*, Fab.—Common and generally distributed. (*To be continued*).—J. W. SAUNT, 53, Enfield Road, Stoke, Coventry.

## CURRENT NOTES AND SHORT NOTICES.

The Linnean Society has awarded Professor E. B. Poulton, F.R.S., etc., the Linnean Gold Medal, as a token of its appreciation of his long and important services to the advancement of zoological science. In a very appreciative and complimentary address, when handing him the Linnean Medal, the President of the Linnean Society gave a brief

account of Poulton's brilliant work; and he finally said—"While occupied with your own researches, and advancing science by your writings, you have always been a most generous and appreciative helper of other workers in your subject. You have been especially successful in stimulating young collectors of insects to extend their interest to the broader problems of bionomics and make real scientific progress, etc. . ." How many of us, like the writer, can thoroughly endorse these remarks.—H.St.J.K.D.

On December 12th we again had the pleasure of listening to a lecture by Professor Poulton at the "Old Vic." on "Animal Warfare." This embraced such varied forms as skunks, snakes, spiders, ants and other insects and their larvae, and was extremely interesting. It was thoroughly appreciated by a large audience, among whom we noticed a few well-known entomologists.—H.St.J.K.D.

The *Entomological News* has a short but interesting article on the Authorship of the Lepidoptera described in the *Encyclopédie Méthodique*, vol. ix., by A. W. Lindsey, of the Denison University, Ohio. He says the authorship of all the Lepidoptera is that of Godart not Latreille. The title of the volume under discussion is *Encyclopédie Méthodique—Histoire Naturelle—Entomologie. ou Histoire Naturelle—des Crustacés, des Arachnides et des Insectes*. Mr. Lindsey extracts from the introduction the following sentence:—"A l'exception des généralités préliminaires, que je m'étois réservées, cet article Papillon lui [Godart] est absolument propre; et si la justice ne me commandoit point cet aveu, je ne craindrois point d'y mettre mon nom." Mr. Lindsey adds a further footnote—"Je n'ai autre part à soi travail que celle de lui avoir fourni des moyens d'exécution et de l'avoir aidé de mes conseils." From this it certainly appears that the authorship of all the lepidoptera contained in that volume should be in future attributed to Godart and not to Latreille.—G.T.B-B.

We quote on a current topic from the *Los Angeles Times*.—"THE BUG HOUSE.—Over in Vienna an eminent biologist has performed some wonderful operations on insect life. He has transposed the heads of various bugs. He has grafted the dome of a beetle on the shoulders of a wasp, and made a mild-tempered and patient creature out of a fussy and useless one. It is significant that in all his experiments the head carries the initiative and inspiration. If he should take it in mind to graft the noodle of a mosquito on the neck of a grasshopper, we would have a blood-thirsty creature with a barb-wire kick and the capacity of a saw-mill. When bees and butterflies have their heads transposed it is the brain that carries control of the body. The bee with the butterfly head becomes frivolous and only seeks the flower for its perfume. On the other hand the butterfly with the brain of the bee attempts all the processes of honey-making and may develop a case of hives. If the scientists keep making progress we may soon see the crossing of a speed bug with a road beetle, and the production of a Ford that can not only think but climb trees."

The following Fellows are the Officers and Council of the Entomological Society of London for the Session 1923. *President*, E. E. Green, F.Z.S. *Treasurer*, W. G. Sheldon, F.Z.S. *Secretaries*, S. A. Neave, M.A., D.Sc., F.Z.S., and H. Eltringham, M.A., D.Sc., F.Z.S. *Librarian*, H. J. Turner. *Council*, R. Adkin, E. C. Bedwell, J. E. Collin, F.Z.S., J. Davidson, D.Sc., F.L.S., J. J. Joicey, F.L.S., F.Z.S.,

etc., F. Laing, R. Wylie Lloyd, W. G. F. Nelson, N. D. Riley, F.Z.S., Prof. E. B. Poulton, M.A., D.Sc., F.R.S., etc., The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., and H. Willoughby-Ellis, F.Z.S.

The following will be the Officers and Council of the S. London Entomological Society for the session of 1923. *President*, N. D. Riley, F.Z.S., F.E.S. *Vice-Presidents*, K. G. Blair, B.Sc., F.E.S., and E. J. Bunnett, M.A., F.E.S. *Treasurer*, A. E. Tonge, F.E.S. *Librarian*, A. W. Dods. *Curator*, S. R. Ashby, F.E.S. *Assistant Curator*, T. L. Barnett. *Hon. Secretaries*, Stanley Edwards, F.L.S., F.E.S., and H. J. Turner, F.E.S. *Recorder*, L. E. Dunster. *Hon. Lanternist*, A. W. Dennis. *Council*, T. L. Barnet, S. A. Blenkarn, F.E.S., F. B. Carr, A. W. Buckstone, O. R. Goodman, F.E.S., T. H. L. Grosvenor, F.E.S., H. A. Leeds, E. Syms, F.E.S., C. L. Withycombe, B.Sc., F.E.S.

The *Bolletino Lab. Zool. Gen. e Agri.* of Portici contains a number of contributions of original work done by the able scientists of the R. Scuola Superiore d'Agricoltura. Prof. Silvestri describes a number of *Staphylinidae* from the Indo-Malay region remarkable for their association with ants. The paper is lavishly illustrated with line drawings. Minozzi gives the ants noticed in the neighbourhood of Sambiasi in Calabria. Grandi contributes an account of his researches on the Parasitic Hymenoptera (*Chalcididae*, *Agaonini* and *Sycophagini*) occupying more than half the volume. Bezzi describes two new *Trypaneidae* (Dip.), which infest the Olive.

Recent numbers of the *Can. Ent.* contain among the more important articles one by J. D. Detwiler on "The Ventral Prothoracic Gland of the Red-humped Apple Caterpillar (*Schizura concinna*)," giving a thorough investigation of the power which the larva has of ejecting an acid fluid from its body; and another by G. C. Crampton, "Notes on the Relationships indicated by the Venation of the Wings of Insects."

The *Ann. Soc. ent. France*, Trim. 1 and 2, just issued, contains the following papers:—Kieffer, "Chironomides de l'Afrique équatoriale," with 4 plates; Joannis, "Revision critique des espèces de Lépidoptères cécidogènes d'Europe"; Brocher, "Étude expérimentale sur la fonctionnement du vaisseau dorsal et sur la circulation du sang chez les Insectes: la *Peviplaneta orientalis*," and the Obituary Notice of the eminent Coleopterist Louis Bedel.

The annual volume of the *Verhand. zool.-bot. Gesell. Wien* for 1921 received a while ago contains a further contribution to the Lepidopterous Fauna of Bosnia and Herzegovina by Dr. Karl Schwerda who since 1906 has worked continuously on this subject. The previous communications he has made will be found with the following references. *Verhand.* 1906; 1908; 1910; 1911; 1912; 1916; 1917; 1918; 1920; *Jahresber. Wien. Ent. Ver.* 1908; 1912; 1913; 1914; 1915; 1916; and *Zeit. st. Ent. Ver.* 1919. Thus a tolerably complete fauna list has been made with notes on particular species. The present article contains a coloured plate.

Conte Turati continues the Faunal work which he has been doing for so many years and there lies before us a very important paper "Materiali per una faunula Lepidotterologica di Cirenaica" 1922, giving an account of the Lepidoptera collected by Don Vito Zanon in Cyrenaica, including new forms which are described by Conte Turati

himself. In a previous paper in 1921 it will be recollected, Conte Turati gave an account of the Lepidoptera collected in the same region during a motor tour by Prof. Ghigi. It is a great pity that such original work is marred by the noninformative nomenclature. *Euchloe belemia glauca distincta alexandri* is an awful infiction, and only tends to make our study a laughing stock to the ordinary seeker after general knowledge, and to the earnest student is a real hindrance without something to show the taxonomic value given to the various names by the user.

The volume of *Annalen des Naturhistorischen Museums* in Vienna for 1921 contains a long paper "Beiträge zur Hymenopteren-Fauna Dalmatiens, Montenegros and Albaniens" by Dr. T. Maidl. It contains an account of the Aculeata and *Chrysididae*.

In the the fifty-first *Annual Report* of the Entomological Society of Ontario we note a paper entitled the "Inter-relations in Nature," in which it is urged upon all observers especially upon the economic entomologist, to look upon this line of study as one of the most important quests. The writer, W. Lochhead, styles all nature "a vast system of linkages" and quaintly reminds one of the rhyming chain of events we were accustomed to in our boyhood days, "This is the cat that killed the rat that ate the malt that lay in the house that Jack built," adding "Man eats the fishes that eat crustacea that eat infusoria that eat bacteria that feed on decaying organic matter in some pond."

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## SOCIETIES.

### THE ENTOMOLOGICAL SOCIETY OF LONDON.

November 15th, 1922.—The Secretary announced nominations for the Officers and Council for 1923.

ELECTION OF FELLOWS.—The following were elected:—Messrs. A. E. Butler, The Nook, Clevedon, Somerset; G. W. Holloway, The Hill, Amberley, Glos.; Rev. J. F. Perry, St. Anne's Priory, Edgehill, Liverpool; G. B. Ryle, Pangbourne, Berks; B. Stewart, Lovell House, Leeds, Yorkshire.

GIFTS TO THE SOCIETY.—The Treasurer announced the bequest of £1,000 by the late Mr. Hamilton Druce, the income from which is to be devoted to the Library. He also stated that Mrs. Newman had presented to the Society a portrait of the late Edward Newman, who was President of the Society in 1853-4.

EXHIBITIONS.—Mr. C. L. Withycombe exhibited a photograph of clusters of larvae of a Cecidomyiid new to Britain, identified by Mr. F. W. Edwards as probably *Miastor hastatus*, Kieff., and the exhibit gave rise to a discussion on the phenomenon of paedogenesis in which Messrs. Collin, Blair and Dr. Imms took part.

Professor E. B. Poulton quoted some original field observations on mimicry in butterflies in Central Africa by Dr. S. A. Neave, and discussed the evidence from various sources respecting the insect visitors of the primrose, particularly *Bombylius* spp.

Mr. Arthur Dicksee exhibited some aberrant examples of *Papilio* from Formosa, including a specimen of *P. horishanus*, in which homoeosis was present.

PAPERS.—The following papers were read:—"A revision of the

Australian species of the Genus *Melobasis*, Fam. *Buprestidae*, Order Coleoptera, with notes on allied genera," by Mr. H. J. Carter, B.A. "Description of the pupal shell of *Lachnocnema bibulus*," by Mr. G. T. Bethune-Baker.

December 6th, 1922.—OBITUARY.—The President announced the death of Mr. H. J. Elwes, F.R.S., a former President, and a vote of condolence with his relatives was passed.

ELECTION OF FELLOWS.—The following were elected.—Mr. Donald Allen, 21, All Saints Road, King's Heath, Birmingham; Mr. H. L. Andrews, c/o John Heelas, Esq., Queen Anne's Mansions, London, S.W.

GIFTS TO THE SOCIETY.—The Treasurer called attention to two new portraits in the Meeting Room, and also exhibited the plans for a new Meeting Room which it was proposed to erect at the back of the present building at some future date. These had been drawn up by Mr. W. Rait-Smith and presented to the Society, and a vote of thanks to him for his generosity in the matter was passed unanimously.

EXHIBITIONS.—Mr. H. Donisthorpe exhibited the larva and pupa case of a species of *Microdon* associated with ants and probably new to Britain.

Mr. W. G. Sheldon exhibited a rare British Tortrix, *Hedya simplana*, F. von R., taken in N. Scotland.

Dr. E. A. Cockayne exhibited examples of homoeosis in butterflies.

Capt. K. J. Hayward exhibited an aberrant example of *Limenitis sibilla* on which scales had apparently failed to develop in patches. It was from the New Forest.

Dr. H. Eltringham discussed the structure of the tympanic organ on the sides of the abdomen in Noctuid moths referred to by Dr. Jordan at a previous meeting.

Dr. K. Jordan, F.R.S., exhibited some mimetic *Castniidae* and gave some account of a scent organ that is found in them.

Mr. L. B. Prout, on behalf of Mr. J. J. Joicey, exhibited Geometrids of the Genus *Bordota*, Wlk., and gave some account of examples of sexual dimorphism and mimicry in these moths.

Mr. H. J. Durrant exhibited some rare and aberrant British Lepidoptera, including a Tortrix *Eucosma plebeiana*, L., new to Britain.

Dr. H. Eltringham, on behalf of Professor Poulton, exhibited further examples of *Heodes phlaeas* race *ethiopica* from S.W. Uganda, and some East African Lycaenids taken by Dr. van Someran, showing the attacks of lizards.

Mr. W. J. Kaye exhibited several remarkable groups of mimetic butterflies from Venezuela.

Mr. W. J. Lucas made some remarks on the food preferences of *Vespa vulgaris*, L.

Mr. L. W. Newman exhibited a series of varieties of British Lepidoptera.

Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited some remarkable and little known butterflies from the island of Buru, including a new *Ornithoptera*.

Dr. H. Eltringham showed on the screen a drawing of the Nempopterid larva exhibited at a previous meeting.

Mr. Martin E. Mosely, who illustrated his remarks with lantern slides, gave some account of a scent organ in New Zealand Trichoptera.

## REVIEWS AND NOTICES OF BOOKS.

THE PROCEEDINGS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. 1921-22. pp. xvii.-83.—The continued progress of this Society, which has attained its 50th anniversary, is again a matter for congratulation. The effects of the unsettling war-time are evidently wearing away, and the Society is now able to register just over 200 members. The Report of the Council modestly mentions that the number last year, 192, was a higher figure than had been reached for many years past. Our information does not go so far back as those days, but we are pleased to think that, with such evident vitality this Society presents a prospect of standing, if not already, before long, as second in number of members to the Ent. Soc. of London alone.

The losses have been few, and the Obituary quite small, although this includes several well known and valued names.

The augmentation of the Society's Collection has continued. The bequest of the late Mr. Ashdown, including 2220 *Coccinellidae*, and Mr. Kemp's British *Odonata*, which goes to make an almost complete series of that Order, are particularly to be noticed. There is a very evident desire exhibited to make the Collections as complete as possible in all available Orders, with the practical object of providing for the wants of students.

The financial position is described by the Treasurer as being only "at least as good as it was a year ago," and this in spite of the generous support of the Publication Fund. The old trouble of unpaid subscriptions would appear to be largely responsible for this disappointment. It would nevertheless appear that the balance of assets over liabilities is quite satisfactory.

In pages the *Proceedings* remain smaller than in former years, due to the continued high cost of printing, but the paper used and the general get-up have not suffered. This restriction of space has prevented the publication of more than the President's Annual Address and three other papers, and these not "in extenso."

The President selected for his subject the old-time tradition of the "Will-o'-the-Wisp." This tale is probably far from extinct yet in out of the way parts of Britain. We have a recollection of the half humorous remonstrance of J. W. Tutt, when we suggested the insertion in the *Entomologist's Record* of a then somewhat recent story from the West of England bearing upon this subject, which might well have ended in tragedy. "Scarcely scientific," was his verdict; but in it went! Personally we have never seen the phenomenon, and therefore have no right to give an opinion, but two or three times we have thought we saw it in likely situations, and suitable times of year. The complete explanation does not appear to be forthcoming, and probably, as the President suggests, there are several. It is far from easy to locate, or examine, objects at night, and we have ourselves known a white handkerchief which was hanging upon a bush near by, to be taken for a ghost at a distance.

The Paper by Miss Cheesman upon the "Oviposition and Larval habits of *Rhyssa persuasoria*," a parasite upon the larva of *Sirex gigas*, based upon the observations and materials of Lord Sligo, deserves notice, as filling a gap in the life-histories of both insects.

Mr. C. D. Soar's notes upon "British *Hydracarina*" revive the hope that our old friend may be persuaded to make the plunge and publish the results of his many years study of this interesting group of one of the "neglected" Orders. Probably there is no one at the present time who knows as much as he upon the subject, and his results have been expected by the Ray Society for many years. We write feelingly, knowing well the hesitation which comes upon students, when they think that they never do know, and never will know, quite enough to encourage them to appear in print.

The third paper, upon "Highways and Byways," by Mr. L. W. Chubb, Secretary to the Commons and Footpaths Preservation Society, will remind collectors that they also possess rights.

A large proportion of the reports of Meetings is occupied by studies of the *Zygaenidae*, chiefly by Mr. T. H. L. Grosvenor, who is making a special study of these Lepidoptera. Whether all the named species are really distinct we do not know, but it would appear from Mr. Grosvenor's experience that there is no great difficulty in obtaining cross-pairing between many of them, which ability would appear to be not uncommon amongst closely allied forms. We recall many years ago that Mr. W. H. B. Fletcher, then of Worthing, devoted some attention to this subject. We think the evidence that a certain proportion of the larvae—of *Z. trifolii* at least, go through a second winter, is new, even if it apply only to larvae reared in captivity.

The curious "Cuckoo-spit" exhibited by Mr. H. Moore, from East Africa, *Ptylus flavescens*, F., would appear to have been at least noticed before it was sent by Mr. S. L. Hinde to Prof. Poulton and recorded in the *Trans. Ent. Soc. London* (? 1906). Reading at random an old volume of *Science Gossip*, 1872, p. 184, we found mention of a similar phenomenon quoted from *Livingstone's Missionary Travels*. In answer to a letter of enquiry, Mr. K. G. Blair kindly explains to the writer that the Psychid described upon p. 43 of the *Proceedings* was identified after the exhibition of the specimens as being *Heterogynis penella*. It is interesting to notice that Bruand in his *Monographie des Psychides* includes and figures *Heterogynis* therein. Needless to say, that although the male imago of this genus closely resembles a *Psychid* the internal structure of the abdomen is totally different.

At the Annual Exhibition special notice was devoted amongst other subjects to Dr. Cockayne's method of examination of Lepidopterous colours by ultra-violet light, to forms of *Papilio machaon*, *Rumicia phlaeas*, and of a large number of other species.

Mr. R. Adkin has, we read, assigned the name var *venosa*, to a very marked streaked form of *Diaphora mendica* from Co. Tyrone.

Of the three Field Meetings, the most successful would appear to have been that held by invitation of Mr. and Mrs. R. Adkin at Eastbourne, when many interesting, if not rare, insects were captured. We again regret the absence of plates. The difficulty connected with their production, at least in Britain, would appear not to have been yet overcome, but we cannot but confess that we should have wished to see at least a portrait of Dr. Chapman.—C.R.N.B.

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*Desiderata*.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether*, "Thelma," 4, Willow Bridge Road, London, N. 1.

*Duplicates*.—*Aglaia*, *Adippe*, \**Io*, *T. quercus*, *Coridon* vars., \**Fuliginosa* (Reading), \**B. quercus* ♀, *Tilia*, *Menthastris*, \**Linariata*, *Aurantiaria*, *Leucophæaria* vars. *Panicus*. *Desiderata*.—Pupæ of *Dictæoides*; Imagines of typhon, palpina, camelina (dark), *Curtula*, *Pyra*, and numerous others; Ova of *Hispidaria*.—*Harold B. Williams*, 112a, Bisham Manor Road, Thornton Heath, Surrey.

*Duplicates*.—*Sybilla*, *Paphia*, *Io* (2), *Selene*, *Lucina* (2), *Ocellatus*, *Illustraria* (autumn), *Nastata*, *Roboraria* ♂, *Prunaria* (4) ♂, *Tipuliformis*. *Desiderata*.—*Castreusis* ♂, *Cucullina*, *Cribrum*, *Cinerea*, *Ravida*, *Ashworthii*, *Notata*, *Obfuscaria*, *Smaragdaria* and others, also vars. and local forms.—*Harold E. Winser*, Kent House, Cranleigh.

*Duplicates*.—*Cinxia*, *Bellargus*, *Coridon*, *H. Comma*, *Lineola*, *Galathea*, *Moneta*, *Nupta*, and many others. *Desiderata*.—*Blandina*, *Irish Icarus*, *Carmelita*, *Cuculla*, *Gonostigma*, *Ashworthii*, *Templi*, *Australis*, *Undulata*, *Smaragdaria*, *Testacea*.—*W. Gifford Nash*, Clavering House, Bedford.

WANTED.—Specimens or coloured drawings. Foreign forms of British varieties of British Lepidoptera. OFFERED: Drawings of 2,000 varieties.—*S. L. Mosley*, Tolson Memorial Museum, Huddersfield.

*Duplicates*.—*Cinerea* ♀, fine forms, grey, brown and blackish, *Maritima* and vars. *Immorata* and other East Sussex species.

*Desiderata*.—Pupæ. *Luteago* (*Barrettii*), *Caesia*, *Albimacula*, *Alpina*, *Xanthomista*, *Sparganii*, *Dissoluta* (*Arundineta*), *Graphalii*. Also imagines of extreme forms *Noctua* in fine condition only.—*A. J. Wightman*, 35, Morris Road, Leves.

CHANGE OF ADDRESSES.—*Rev. G. Wheeler*, c/o Miss Swaine, Briarfield, Guildford. *B. C. S. Warren*, 14 Avenue de l'Eglise Anglaise, Suisse.

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## MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. Annual Meeting, 1923, January 17th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. 1923, January 25th, Annual Meeting.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

The London Natural History Society (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

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**Acanthomyops (Donisthorpea) brunneus, Latr., a species of  
Formicidae new to Britain.**

By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

**Acanthomyops (Donisthorpea) brunneus, Latr.**

*Formica brunnea*, Latreille, *Ess. Hist. Fourmis France*, 41 (1798)<sup>1</sup>; *Hist. Nat. Fourmis*, 168 (1802)<sup>2</sup>; Jurine, *Nouv. Meth. Class. Hymén.*, 273 (1807)<sup>3</sup>. [“La fourmi brune,” Huber, *Moeurs Fourmis*, 52 (1810)]<sup>4</sup>. *Formica brunnea*, Losana, *Mem. Accad. Sc. Torino*, 37, 319 (1834)<sup>5</sup>; Schilling, *Übers. Arbeit. Schles. Ges. varterl. Cultur.*, 55 (1838, 1839)<sup>6</sup>. *Formica timida*, Förster, *Hym. Stud.*, 1, 35 (1850)<sup>7</sup>; Schenck, *Jahrb. Ver. Naturk. Nassau*, 8, 53 (1852)<sup>8</sup>. *Formica brunnea*, Schenck, *Jahrb. Ver. Naturk. Nassau*, 8, 126 (1852)<sup>9</sup>. *Formica timida*, Mayr., *Verh. Zool. Bot. Ver. Wien*, 5, 361 (1855)<sup>10</sup>. *Formica brunnea*, Nylander, *Ann. Sc. Nat.*, 5, 68 (1856)<sup>11</sup>. *Lasius brunneus*, Mayr, *Europ. Formicid.*, 50 (1861)<sup>12</sup>; Taschenburg, *Hymen. Deutschl.*, 240 (1866)<sup>13</sup>. *Lasius niger* race *brunneus*, Forel, *Denkschr. Schweiz. Ges. Naturw.*, 26, 46, 49, 50, 217 (1874)<sup>14</sup>. *Lasius brunneus*, Er., André, *Rev. Mag. Zool. (S.3)*, 2, 180, 202, 216, 217, 219, 226 (1874)<sup>15</sup>; *Ann. Soc. Ent. France (S.6)*, 1, 60 (1881)<sup>16</sup>; *Spec. Hym. Europe*, 2, 193, 198, 201 (1882)<sup>17</sup>; Lubbock, *Ants, Bees, Wasps*, 68 (1882)<sup>18</sup>. *Lasius niger* st. *brunneus*, Bryant, *Fourmis France*, 56 (1890)<sup>19</sup>. *Lasius brunneus*, Wasmann, *Tijd. Entom.*, 34, 41, 45, 48, 62 (1891)<sup>20</sup>. *Lasius niger* race *brunneus*, Lameere, *Ann. Soc. Ent. Belg.*, 36, 64 (1892)<sup>21</sup>. *Lasius brunneus*, Dalla Torre, *Cat. Hym.*, 7, 182 (1893)<sup>22</sup>; Wasmann, *Tijd. Entom.*, 41, 14 (1898)<sup>23</sup>; 42, 163 (1899)<sup>24</sup>; *Arch. Trim. Inst. Grand Ducal Luxemburg*, 1, 11, 12 (1906)<sup>25</sup>; Escherich, *Ameise*, 220, 221 (1906)<sup>26</sup>. *Lasius niger brunneus*, Bondroit, *Ann. Soc. Ent. Belg.*, 53, 486 (1909)<sup>27</sup>. *Lasius (Lasius) brunneus*, Ruzsky, *Hazan Vet. Inst.*, 29, 620, 633 (1912)<sup>28</sup>. *Lasius brunneus*, Adam and Foerster, *Mitt. Badisch. Landesver. Naturk. Naturw.*, 1913, 210<sup>29</sup>. *Lasius (Lasius) brunneus*, Forel, *Mitt. Schweiz. Ent. Gesell.*, 12, 52, 54, 55 (1915)<sup>30</sup>. *Lasius brunneus*, Schmitz, *Natur. Genoots. Limburg*, 1915, 72-75<sup>31</sup>. *Formicina (Donisthorpea) nigra* subsp. *brunnea*, Emery, *Bull. Soc. Ent. Italiana*, 167, 170, 174, 177 (1916)<sup>32</sup>. *Lasius brunneus*, Crawley; *Ent. Rec.*, 32, 197 (1920)<sup>33</sup>; Soudek, *Zula. Otisk. Caso. Moravsk. Musea Zemsk.*, 4, 7 (1922)<sup>34</sup>.

♂ Dirty yellow brown, head above and funiculi of antennae darker; gaster blackish brown; scapes of antennae, mandibles, and tarsi brighter yellow.

Head broader than thorax; ocelli small but distinct; eyes somewhat smaller than in *niger*; frontal furrow well marked reaching median ocellus; scapes without outstanding hairs. Thorax with short silky pubescence more distinct at sides. Scale square, slightly emarginate at apex. Tibiae without outstanding hairs. Long, 3·7-5mm. (2·5-4mm. teste André).

Described from a number of ♂ ♀ from Theale.

♀ Lighter or darker yellowish brown; mandibles, antennae and legs lighter yellow.

Head nearly as broad as thorax (considerably more so than in *niger* and *flavus*); scapes and tibiae without outstanding hairs; wings infuscate at the base. Long: 7·8-5mm. (6-9mm. teste André).

Described from a dealated ♀ taken by me at Les Agittes, in Switzerland, October, 1912, and a winged ♀ from Bulgaria in my collection.

FEBRUARY 15TH, 1923.

Original description of *Formica brunnea*, Latreille [*Ess. Hist. Fourmis France*, 41 (1798)]:—

“17\* *F. brune. brunnea.*

O.p. Ferrugineuse foncée. Yeux, sommet de la tête et abdomen, noirâtres. Ecaille carrée, presque bidentée.

*Fenelle.* Brune noirâtre. Mandibules, antennes et pattes, ferrugineuses. Ecaille bidentée. Abdomen large. Ailes longues: quelques nervures obscures sur la base des antérieures.”

The male of *Formica timida* was described by Schenck [*Jahrb. ver. Naturk. Nassau*, 8, 54 (1852)] as follows:—

“M. 2 L., auch kleiner. Glanzend schwarz. Oberkiefer schwarz mit einem etwas rötlichen zähne, zuweilen fast zweizählig. Stirnrinne sehr tief, von den Stirnfeld bis zum mittleren Nebenaugen. Augen kahl. Fühler schwarzbraun, die Geißel nach dem Ende etwas heller; Steilchen und Endglied der Geißel weisslich. Beine schwarzbraun, Gelenke und Tarsen blässröthlich, oft fast gelblich. Schuppe meist stumpfwinkelig ausgerandet, auf jeder seite der Ausrandung line Spitze mit langen Borsten. Körper sparsam mit Borstenhaaren. Flügel bis zur Mitte schwach bräunlich getrübt, Adern und Randmahl braunlich. Am ähnlichsten der M. der *fuliginosa*. (den Unterschied f. bei dieser). Vor dem M. der gelben Arten schon durch die kahlen Augen leicht zu unterscheiden; charakteristisch ist auch die Gestalt der Schuppe.”

### Habitat.

*Acanthomyops (Donisthorpea) brunneus* occurs in Europe—France<sup>1</sup>, Belgium<sup>21</sup>, Holland<sup>22</sup>, Switzerland<sup>14</sup>, Germany<sup>26</sup>, Luxemburg<sup>25</sup>, Italy<sup>32</sup>, e.c.; Asia—Caucasus<sup>17</sup>, Asia Minor<sup>17</sup>, Palestine<sup>17</sup>, Persia<sup>33</sup>; and Africa—Algeria<sup>17</sup>.

British distribution as at present known:—

#### Berkshire, Theale (Joy).

A strong colony of this ant was discovered by Dr. N. H. Joy in the hollow of a large felled poplar, at Theale, in Berkshire, on January 21st, 1923. As he realized that the species was unknown to him, he sent some workers on to me to name, and these I at once recognized as *A. (D.) brunneus*, Latr., an ant new to the British list. On February 6th I visited the nest with him and brought home a few of the workers to form a small colony in an observation nest. It is true that *brunneus* was recorded as British by the late F. Smith [*Cat. Brit. Fossor. Hym.*, 11, 224 (1858): *Trans. Ent. Soc. Lond.* (S. 2), 4, 278 (1858), etc.]; but in his 1871 Catalogue [*Cat. Brit. Hym. Acul.*, 2 (1871)] he gives it as a synonym of *umbratus*. It should probably have been referred to *A. (C.) miatus* (as neither that species nor *brunneus* possess outstanding hairs on the tibiae), which was not then known as British. Smith's record for Deal consisted of a solitary female, sorted out from a lot of other ants [*Ent. Ann.*, 1858, 39], and was almost certainly *miatus*. It will thus be seen that Dr. Joy's capture is a genuine addition to the somewhat poor ant fauna of this country.

*A. (D.) brunneus* is a very timid ant [hence Förster's appropriate name?] of retiring habits, and seldom leaves its nest; which will account for its rarity here. When the nest is exposed the ants seek safety in flight with great rapidity. It principally nests in old tree trunks—Schenck<sup>9</sup> says chiefly oak, more seldom in lime; Forel<sup>14</sup> gives walnut, chestnut, and lime; and Mayr<sup>10</sup> records it in *Populus alba* from Vienna—and prefers parks and wooded land to more open country. It has also been found under bark and in rotten wood, at the roots of trees, under stones, and even in the walls of houses.

According to André<sup>17</sup> it feeds almost exclusively on the excreta of large aphides which it rears in the galleries of the nest; Lubbock<sup>18</sup> says it devotes itself principally to the aphides which live on the bark of trees; and Schenck<sup>8</sup> mentions large grey plant lice which are found with it, and when disturbed the ants at once take them into the galleries. The marriage flight is said to occur in June and July, and Schenck<sup>8</sup> says it takes place between five o'clock and eight o'clock in the morning. The following myrmecophiles have been found with *A. (D.) brunneus* on the continent:—

**Coleoptera:** *Homoëusa acuminata*, Mark.<sup>31</sup>; *Microglossa pulla*, Gyll.<sup>20</sup>, *Ilyobates glabriventris*, Rye<sup>20</sup>, *Myrmedonia lugens*, Gr.<sup>20</sup>, *Atheta nitidula*, Kr.<sup>31</sup>, *Euryusa laticollis*, Heer.<sup>20</sup>, *E. sinuata*, Er.<sup>20</sup>, *Claviger durali*, Saulcy<sup>15</sup>, *Batrissus fornicarius*, Aubé<sup>8</sup>, *Batrissodes delaportei*, Aubé<sup>15</sup>, *B. adnevus*, Hmpe<sup>31</sup>, *B. venustus*, Reich<sup>31</sup>.

**Araneina:** *Phrurolithus festivus*, C.K.<sup>31</sup>, *Dysdera cambridgei*, Thor.<sup>31</sup>

**Acarina:** *Trachyuropoda bostocki*, Mich.<sup>24</sup>

**Crustacea:** *Platyarthrus hoffmanseggi*, Brdt.<sup>50</sup>

This is the second species of ant that has been discovered in Britain since the publication of my book on British Ants in 1915. The first of these was *Myrmica schencki*, Emery, discovered by Mr. H. M. Hallett at Sully, Glamorgan, and introduced as British by myself [*Ent. Rec.*, 27, 265-6 (1915)]. A description of the ♂ of *M. schencki* may be found in the *Record* for 1917 [*Ent. Rec.*, 29, 32 (1917)].

## On the Geographical and Seasonal Variations of *Pararge megera*, L.

By ROGER VERITY, M.D.

(Concluded from vol. xxiv., p. 214.)

Grade III.: As I have mentioned in connection with *filipluma*, the summer characters of the latter get more and more accentuated as one proceeds southward, and the difference between them and those of the spring generation increase proportionately. One thus comes to a region where a distinct grade is discernible in the main line of variation, as compared with nymotypical *filipluma* of Belgium, England, etc., and where other features contribute to produce races perfectly different from it, transitional to those of the extreme south. Besides belonging on an average to grade III. by the underside of the hindwings, the shape of the wings is seen to be narrower, more pointed at apex and with a straighter outer-margin, culminating in form *porrecta*, Vrtv. (*Ent. Rec.*, xxxi., p. 126), the upperside markings are less extensive; the basal black patch of hindwings is very much lighter in tone and often nearly obliterated by the abundance of fulvous scales, the fulvous is brighter and notably so in some females. In the materials I have at hand I detect two primary races:—

Race *vividior*, *mihi*, can be described as simply being the grade which follows *filipluma* on the main line of variation. Roughly its distribution may be said to include the greater part of the Iberic zone, the south of France (specimens I possess from Chautonnay in Vendée are already clearly a transition to this race), and the north of Italy; probably it is found even north of the Alps in particularly warm localities (certainly, for instance, in some parts of the Rhone valley). Remarkably large individuals appear now and then, especially in the female sex, and there are localities, such as the valleys of South Tyrol,

where they are so abundant that one has the impression of a distinct secondary race, which might well be named *GRANDESCENS*, mihi. Oberthür mentions twice in his *Études de Lép. Comp.*, vol. iii., p. 364, and x., p. 352, the race of Lectoure (Gers) as being remarkable, because of its strong tendency to an increase in the number of eye-spots, such as he has observed nowhere else. This race seems worthy of being recorded by a name, and I propose that of *OCELLATOR*, mihi.

RACE *PRAEAUSTRALIS*, Vrry., II. and III. generations *PAENINSULITALICA*, mihi, exhibits all the features of *vidior*, but in addition to them it possesses others which include it in the south-eastern *lyssa* line of variation. These consist in the silvery white ground-colour of underside of the hindwing, instead of the yellowish tinge of *filipluma* and *vidior*, and in the pearly grey tone of its diffusible scaling. In *vidior* and in *vididissima*, to be described in grade IV., this scaling is broken up into more or less narrow bands and patches, but these are dark and they stand out sharply on the yellowish ground-colour. In *paeninsulitalica* these bands and patches are only slightly darkened and they shade off into the white ground-colour. It constitutes the summer generations of race *praeaustralis*, and it spreads over the whole of the Peninsular Italic zone. I select as "typical" the second (June) generation, and the third (September), from the locality of my "typical" *praeaustralis*. It will be observed that they are but a grade further along the same line of variation as the latter and also that they differ less from it than does *vidior* from its own first generation. The size of *paeninsulitalica* is, on the whole, smaller than that of *vidior* and the very large individuals, found so frequently in the latter, are quite scarce here.

Under the name of *tigeliiformis* I have described in the *Bull. Soc. Entom. Italiana*, xlii., p. 269 (1911), a series of specimens I had collected near Piteglio, m. 700, in the Pistoiese Apennines (Tuscany) at the end of August of that year. They are very striking on account of the reduced extent of all the black markings above and especially on account of the total obliteration of the band which precedes the eye-spots on the hindwing, so that by these characters they might at first sight be mistaken for *tigelius*, their small size also contributing to increase the resemblance. A more accurate comparison, however, soon shows that they are not even transitions to it, because they show no signs of the chief characteristics of *tigelius* on the underside, and a further proof is that even the most extreme examples could not be mistaken for it, whilst no *tigelius* ever exactly resembles *tigeliiformis*; there is always a distinct gap between them. Since 1911 I have found this form to be largely prevalent, mixed with a few individuals bearing traces of the band mentioned, in other localities, such as the extremely parched one of Quercianella on the Tuscan coast, south of Leghorn. In these localities it thus constitutes a remarkable secondary aberrative race. As an individual form occurring occasionally it is mentioned by Zeller, Calberla, Oberthür and others and in fact it is not infrequent as an individual variation of *paeninsulitalica* in all sorts of localities, and I even possess a small specimen of *praeaustralis*, with the features in question well marked on the upperside, collected in Florence on March 30th, showing it is produced by unsuitable conditions of various sorts.

Grade IV. : By the name of race *VIVIDISSIMA*, mihi, I should distinguish the striking summer generations of the race of the south of Spain and of some localities of Palaearctic Africa, larger in size than any other of the species and more brilliant in colouring on the upper-side, especially in the female sex ; some specimens are of a beautifully intense reddish fulvous, others, on the contrary are of a light yellowish fulvous, but usually very bright ; the dark pattern is more slender than in *vidior* and the black is often mixed with chestnut, which gives it a reddish tinge rather than a deep black one ; in some females it is quite pale on this account. (This form *CASTANEOPICTA*, mihi, is frequent also in Italy in *paeninsulitalica*.) The underside of *vidissima* can, on the whole, be described as a grade further than *vidior*, but there exists a greater amount of individual variation than in other races, some specimens resembling *vidior* and others *depulverata* of grade V.

Race *lyssa*, Hübner, *Eur. Schmett.*, I., pl. 186, figs. 914 to 917 : Kirby in his Catalogue only mentions Hübner in connection with this name. All the other writers, on the contrary, attribute it to Boisduval (*Ich. Hist. Lép.*, I., p. 222, pl. xlv., figs. 4, 5), on account of the wrong dates in connection with Hübner. As Hübner's plate 186 is amongst those issued from 1823 to 1833 and Boisduval's book was published from 1832 to 1841, it seems, on the strength of these new dates, all probabilities are in favour of the former having appeared before the latter, but how it came about that Boisduval used the same name as Hübner, without quoting him, remains a mystery. The only conjecture I can make is that the name was used *in litteris* by other entomologists and that specimens were sent to both labelled with it, as in the case of *E. jurtina* race *hispulla*, published at about the same time by Esper and by Hübner, and as in other instances of the sort, which are quite surprisingly numerous in entomological literature. The features characteristic of the *lyssa* line of variation exist both in Hübner's and Boisduval's figures. The latter effectively described them as conferring on these *megeera* a look very similar on the underside of hindwings to that of *maera*, L. At a closer inspection I find that what produces this is their more uniform tone, as also the darker and sharper streaks and circles round the eye-spots standing out more boldly and these circles being broader ; the more uniform tone is due to the diffused scaling being either entirely absent, in extreme examples, or very pale and shadowing off in the silvery white ground-colour, so that no distinct bands and patches are to be seen, precisely as in *maera* ; this character exists also on the basal half of the wing ; here, in the fore-part of the space between the two central streaks and between them and the base, there survive traces of some darker patches than the rest of the diffused scaling, even in the greater number of the *paeninsulitalica* individuals which resemble *lyssa* most, whereas these darker patches never appear in *lyssa*, just as they are never seen in *maera*. Hübner's figures of *lyssa* by no means represent the most extreme and characteristic form along this line of variation ; on the upperside the dark pattern is as extensive as in nymotypical *megeera* of the north of Europe ; on the underside the diffused scaling is, on the whole, more like grade III. than like the well characterised *lyssa* in extent, but, notwithstanding this, the *maera*-like aspect is unmistakably there. Boisduval figures specimens from Dalmatia in which all the dark markings

of both surfaces are very much less extensive. Staudinger in his notes on the Lepidoptera of Greece had observed as early as 1871 (*Horae Soc. Ent. Rossicae*, vii., p. 78) differences of this sort in the *lyssa* of various localities in the Balkans, and finds it worthy of attention that specimens of the first generation from the Parnassus are lighter beneath than are June ones from Naxos and others from Smyrna. This is due to the fact that in *megeva* seasonal dimorphism increases from north to south as far as the region of race *viridior*, because, as I have pointed out, the summer generations gradually change aspect, and that south of this region, in the Eastern Mediterranean, that dimorphism decreases again, because the first generation begins to follow in the same track of variation and ends up, in the southern Balkans and in Sicily, by acquiring the same aspect as the summer generations. The light and the dark forms are thus produced by all the generations and it is chiefly a matter of local conditions when one prevails markedly, as observed by Staudinger.

Race *australis*, Zeller (*Isis*, 1847, p. 140): This author collected *megeva* at Messina from the end of January onwards and got a few specimens at Syracuse in July. He too, who was so keen on seasonal polymorphism and describes it so well in many species, makes no remark about it in this one, but he describes the Sicilian race by the following words: "Wings more broadly ochreous, streaks on underside of forewings thinner, underside of hindwings light grey." I possess series from the neighbourhood of Palermo, collected during the spring, and one series from the Ficuzza (in the hinterland south of this town) collected in August. Both series contrast markedly on the upperside with Hübner's figures of *lyssa* by the limited extent of the black markings, and also with Boisduval's, although to a lesser degree; they are as reduced as the species can exhibit them normally, except for *tigelius*. In the spring series none of my specimens have the band of the hindwing obliterated, as in *tigelius* and *tigeliiformis*, but all my August males have it entirely cancelled. As to the underside, it constantly exhibits the features of the *lyssa* line of variation. I find that most specimens of both generations are quite alike, *i.e.*, with diffused scaling a little less extensive than in Hübner's figure and a little more so than in Boisduval's, but that variation in the first generation tends to produce forms culminating in a uniform pale grey scaling on the ground colour, which recalls the darkest northern races of *maera*, whereas in the summer generations it culminates in the disappearance of all grey scaling, so that the ground colour remains of a perfectly pure silvery white. I think that one is quite justified in selecting as the nymotypical form of Zeller's *australis* the characteristic spring form just described, both because his description of either surface suits it admirably and because one understands that nearly all his specimens were collected at Messina in the spring. The features he mentions also separate well his Sicilian race from *lyssa*. His name can thus be used for the first generation of Sicily. As to the summer generations one must conclude that they have remained to this day undescribed and unnamed. To them, no doubt, belonged the Sicilian specimens mentioned by Oberthür as particularly interesting because the male scarcely differs from *tigelius*, although the female always has the upperside pattern more developed than in the latter. I too, in fact, find no *tigeliiformis* amongst my females. I should not,

however, consider the males a transition to *tigelius*, as does Oberthür, but simply a parallel variation of the upperside characters, because the underside follows quite a different line. I propose the name of *TIGELLYSSA*, mihi, for the forms just described, which combine the features of *tigeliiformis* on the upper surface with those of *lyssa* on the underside, taking as "typical" my series of the *Ficuzza*. This name can thus well be extended to the summer generations of Sicily, taken on the whole.

Grade V. : Race *depulverata*, Frühstorfer, *Internat. Entom. Zeitschr. Guben*, III., p. 133 (September 4th, 1909), is described as follows: "The ground-colour is lighter than in Spanish examples. On underside of forewings the black bands are narrower than in European specimens. The hindwings are prevaillingly yellowish and the grey suffusion is either entirely absent or only imperceptibly shadowed." The "types" were from Algiers, Philippeville and Oran, collected by Seitz, but no mention of their dates of capture is made. I think one can safely infer from the description that it applies to the summer generations, because the African winter one is, to my knowledge, distinctly dark on the underside, whereas this is evidently the culminating degree in the reduction of the dark diffused scaling. The light coloured upperside also distinguishes this race from *vididissima*, Vrtý., of other African localities. It will be interesting to know how these various African races and forms stand to each other and what their distribution is exactly.

Form *INFRATERSA*, mihi: I have already stated that amongst the Sicilian summer individuals there occur frequently some with the ground-colour of the underside of the hindwings clear silvery white or very pale pearl-grey, on account of the total or nearly total absence of grey diffused scaling. This form is parallel to the African *depulverata*, in which the ground-colour is, instead, yellowish. Seitz in his *Gross-schmett.* figures a specimen of this sort as *lyssa*, but, now we want to carry analysis further, we must note that it is very different from that of Hübner, although it represents the superlative degree on the same line of variation. I think it will be found necessary to distinguish it by the name of *infratersa* and I venture to forecast that it will be found to predominate in some localities and that it will rise to the rank of race. As a matter of fact, there remains to establish what distribution and what seasonal connections *lyssa*, *infratersa* and *tigellyssa* have in the Balkanic zone and in Asia Minor. In the *Ent. Rec.* for 1919, p. 126, I named *emilyssa*, from specimens collected on the Bosphorus, a form with heavy black markings on the upperside and "total lack of grey scaling on the underside of hindwings." Now that Hübner's dark *lyssa* must be considered nymotypical, my *emilyssa* is scarcely worth distinguishing from it (I then compared it to Boisduval's), but the name can still be useful to designate the form in which the upperside has very extensive markings, whilst the underside is the very light *infratersa* one.

The following little Table shows how the different primary races of *P. megera*, L., and their generations, stand to each other:—

	A	B	C	D
I. :	<i>I. g. infrapallens.</i>	<i>I. g. megera.</i>	<i>I. g. tigellina.</i>	
II. :		<i>II. g. filipluma.</i>	<i>II. &amp; III. g. tigelius.</i>	<i>I. g. praeaustralis.</i>
III. :		<i>II. &amp; III. g. vividior.</i>		<i>II. &amp; III. g. paeninsulitalica.</i>

	A	B	C	D
IV. :		II. & III. g. <i>vividissima</i> .		{ I. g. ? <i>lyssa</i> . { I. g. <i>australis</i> . { II. & III. g. <i>tigellyssa</i> .
V. :	II. & III. g. <i>depulverata</i> .			

The Roman figures in the first column stand for the successive grades of the main line of variation described at the beginning of this paper. The four other columns are characterised by the following features on the underside of hindwings :

A : Ground-colour yellow or reddish-yellow.

B : Ground-colour yellowish ; diffused scaling blackish in tinge.

C : Ground-colour mostly white ; diffused scaling of basal half of wing much more extensive and intense than that of outer half.

D : Ground-colour silvery-white or pearl-grey ; diffused scaling grey in tinge.

The blank spaces in the above table correspond to features which to my knowledge, have not for the present been observed to prevail in any locality, so that they are not characteristic of any race or generation, but they simply occur as variations. If it be found necessary to designate them, the following names may be useful :—

In the A line of variation, grades II. III. and IV. might be called respectively : LUTEAFILIPLUMA, LUTEAVIVIDIOR, LUTEAVIVIDISSIMA, as they resemble the corresponding grades of line B, but they have a more decided tinge of yellow or reddish-yellow on the underside. They are to be met with in Palaearctic Africa.

In the B line of variation, grade V., of a paler yellow on underside than *depulverata*, might be called PALLIDEDEPULVERATA. Found in Africa and southern Spain.

In the C line of variation, I only know of the existence of grade III. as the form with the lightest underside markings in the summer generations : TIGELICLARA.

In the D line of variation, grade I. is exhibited by individuals of I. gen. *pracaustralis* from Peninsular Italy, with the darkest undersides : the diffused scaling, however, is always of a paler tinge than in nymptypical *megea*, and they might well be called INFRACANENS. As to grade V., it is the form I have described above under the name of *infraterra*.

The races of *Pararge megea*, L., and their generations can be summarised as follows :—

Race *megea*, L. : I. gen. *megea*, L. ; II. gen. *filipluma*, Ball. Described from "Austria and Denmark," it probably extends to the whole of northern and central Europe, with local variations such as the following :—

Secondary race *caledonia*, Vrtv. ; Described from the northern coast of Scotland, is presumably produced in many particularly damp localities.

Secondary race *alticola*, Vrtv. : Described from the Baths of Valdieri, m. 1875, in the Maritime Alps, is produced in surroundings unsuitable to the species, and chiefly in extremely dry and hot ones.

Secondary aberrative race *mediolugens*, Fuchs : Middle Rhine, locally.

Race *vividior*, Vrtv. : I. gen. *megea*, L. ; II. (and III.) *vividior*, Vrtv. : Iberic, Franco-iberic, and Northern Italic zones.

Secondary aberrative race *ocellator*, Vrtý.: Lectoure (Gers.).

Secondary race *grandescens*, Vrtý.: Described from South Tyrol, but presumably in all the regions of *vidior* locally.

Race *vidiissima*, Vrtý.: I. gen. *megea*, L., or *infrapallens*, Vrtý.; II. and III. gen. *vidiissima*, Vrtý.: South of Spain and in some localities of Palaearctic Africa.

Race *depulverata*, Frühst.: I. gen. *megea*, L., or *infrapallens*, Vrtý.; II. (and III.?) gen. *depulverata*, Frühst.: Described from Algiers, Philippeville, and Oran.

Race *praeaustralis*, Vrtý.: I., gen. *praeaustralis*, Vrtý.; II. and III., gen. *paeninsulitalica*, Vrtý. Described from Florence, spreads to the whole of Peninsular Italy.

Secondary aberrative race *tigeliiformis*, Vrtý. Described from Piteglio, m. 700, in Tuscan Apennines, is produced locally in extremely parched surroundings.

Race *lyssa*, Hüb.: generations still undefined. Balkanic zone and Asia Minor.

Race *australis*, Zeller: I., gen. *australis*, Zeller; II. and III., gen. *tigellyssa*, Vrtý. Described from Messina, spreads to the whole of Sicily and perhaps to the localities of the Balkanic zone and Asia Minor.

Subspecies *tigelius*, Bonelli (= *paramegaera*, Hüb.): I. gen. *tigellina*, Vrtý.; II. and III., gen. *tigelius*, Bonelli. Corsica and Sardinia.

Note.—Not being acquainted with the two Asiatic forms *megaerina*, H. S., and *transcaspica*, Stdgr., I cannot establish their position in the variations of the species.

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### Myrmecological Notes.

By W. C. CRAWLEY, B.A., F.E.S., F.R.H.S.

#### *Cerapachys* LAMBORNI, sp. nov.

♂ L. 5 mm. Black; mandibles, antennae with the insertions, tarsi and trochanters, joints of coxae, the extremities of femora and tibiae and apex of gaster, russet. Whole body with a moderately long semi-adjacent pilosity.

Head a fraction longer than broad, slightly broader behind than in front, the sides feebly convex, the occipital border slightly concave, the posterior angles not sharp.

Mandibles broad and triangular, the terminal border, which is slightly concave, is nearly twice as long as the internal, its basal half armed with a few minute blunt teeth. Clypeus short, concave from back to front, the anterior border feebly convex; the frontal carinae, one with the clypeus, form a lobe on each side between the articulations of the antennae; they converge behind, and are wider in front than in *cribrinodis*; the anterior part of each carina, which carries the insertion of the antenna, is narrow and not bilobed as in *cribrinodis*. The carinae on cheeks are low, straight, and the anterior portion is raised in a blunt knob.

Eyes slightly behind the middle of sides. Scapes very thick, reaching a little beyond half the distance to occiput. All joints of funiculus broader than long except the apical, which equals the 4 preceding.

Dorsum of thorax slightly contracted in the middle, the epinotum broader than the pronotum, the whole feebly convex in both directions; faint indications of both sutures barely visible. Declivity of epinotum finely bordered. Node nearly twice (1.7) as broad as long, truncate behind and before, very slightly broader behind, convex above, underneath with a blunt triangular tooth. Postpetiole (first segment of gaster) wider than petiole, wider behind, straight in front and at back, considerably wider than long.

Whole body shining; mandibles punctured, head smooth and shining with scattered punctures. Mesonotum similarly punctured, but front of pronotum and the base and sides of epinotum coarsely rugose-punctate. Declivity smooth and

shining. Petiole and postpetiole coarsely reticulate-punctate. Gaster smooth and shining, with small scattered points.

Type B.M. Monkey Bay, Lake Nyassa. (Dr. W. A. Lamborn, 1915. No. 100.) Differs from *cribrinodis* in the points indicated, and in its larger size, darker colour, thicker node, and sculpture.

*Prenolepis* JACOBSONI, sp. nov.

♀ L. 2.6 mm. Yellow testaceous, head somewhat darker, the gaster dark castaneous, lighter in some specimens.

Mandibles with 6 teeth. Head small, oval, as long as broad, broadest at eyes which are large and prominent and situated barely behind the middle of sides; the head narrows rapidly behind the eyes, the occipital border straight. Clypeus carinate, the anterior border feebly sinuate, the posterior border marked out with a black line. Frontal area deep. Scapes long, extending more than half their length beyond the occipital border.

Thorax strangulate and emarginate at mesonotum, the pronotum and mesonotum forming a curve with an obtuse angle at the suture, and the epinotum forming a rounded convexity. Scale thick, very inclined, straight and sharp-edged at top, the stalk long and thick, the whole pedicel fitting into a recess in the basal segment of gaster. This latter is concavely truncate at its anterior border.

Head and gaster provided with plentiful long yellow-brown hairs; pronotum has one pair of short followed by two pairs of long hairs; the mesonotum has one or two pairs of short hairs. The legs and antennae covered with plentiful long semi-adjacent pilosity. There are a few short adpressed hairs on the cheeks. Entirely smooth and shining.

Fort de Kock, Sumatra. (Leg. E. Jacobson. No. 1088.) Type W.C.C. coll.

Recalls *Pr. naoroji*, Forel, from Assam and N.-W. India, but thorax not so pilose, the epinotal convexity only a little more than half the pronotal convexity (in *naoroji* not much shorter than the pronotal). The scale, truncation of gaster, and length of scapes apparently similar.

*Camponotus (Myrmamblys) reticulatus*, Rog., race *sericellus*, Vieh., var. RUGOSIOR, var. nov.

♀ Major, L. 5 mm. Slightly smaller than *sericellus*, the sculpture of head coarser, and pubescence on gaster less abundant. Mandibles with six teeth. The light colour of head extends as far as the eyes and over a great part of the space between the frontal carinae. Frontal area dark. Bands on the borders of the segments of gaster almost white. Otherwise corresponds to Viehmeyer's description of *sericellus* from Singapore.

♀ minor, L. 3.5 mm. Slightly smaller, otherwise corresponds to the race description.

♀ L. 5.5 mm. The light colour of head more sharply defined than in ♀ major, and does not extend beyond the articulations of the antennae nor between the frontal carinae. Wings hyaline. Wing insertions yellow-white. Head smaller and narrower in front, and mandibles less massive than in ♀ major. The angle between base and declivity of epinotum rounded. Otherwise like ♀ major except for sexual differences.

♂ L. 4 mm. Dark brown, gaster darker, almost black; mandibles, extremities of cheeks, and articulations of antennae, paler; insertions of wings and the two hind coxae yellow-white. Borders of segments of gaster not paler than rest. Gaster abundantly pilose.

The scapes extend more than one-third of their length beyond the occiput. Mandibles edentate. Clypeus feebly convex, the anterior border straight. Eyes occupy more than half the sides of head, which narrows behind. Node low and thick.

Whole head feebly reticulate; the thorax more faintly so, and shining; gaster densely and finely transversely reticulate.

Sumatra, Fort de Kock, 1921. 920 M. (Jacobson, 1175.)

Kindly compared with a co-type by Prof. Emery. Types W.C.C. Coll.

*Camponotus (Myrmosericus) rutoglauca*, Jerd., race *feai*, Em., var. *erythropus*, For.

♀ (Hitherto undescribed.) L. 12 mm. Black; mandibles, most of clypeus, cheeks, insertion of antennae, frontal area and frontal carinae, the antennae, except the apical segments, and the legs, red; thorax dark reddish-brown. Wings hyaline, nervures brown.

Head as broad or broader than thorax. Scale thin, broad and widely excavated at apex. Otherwise like the ♂ major.

Canary Islands. Dublin Museum, 11-1895.

*Polyrhachis thrinax*, Rog., var. *javanica*, Mayr., ♀.

The var. *javanica*, according to the description, has legs and antennae ferruginous, but two specimens from Sumatra have the antennae (except the last three or four joints of funiculus) and entire legs, dark brown or black. Emery tells me he has a specimen from Singapore with similar colouring. As there does not appear to be any other difference in these specimens from the type, I prefer to record them as var. *javanica*, Mayr, simply.

Fort de Kock, Sumatra. (E. Jacobson, 1097, 1920.)

Forel (*Formicidés des Indes et de Ceylan*, Part 111) refers to "race *javana*, Mayr," and is followed by Bingham (*Fauna of British India*; vol. ii., *Formicidae*, p. 411). The name given by Mayr to his variety in *Tijds. voor Entom.*, x., 1867, p. 20, is *javanica*.

*P. rastellata* var. *javana*, Vieh. ♀ L. 6 mm.

A single ♀ appears to be this variety, as the legs are red and the tarsi black, as given by Viehmeyer as the colour of his var. *javana* (♀). He gives no description of the ♀.

Fort de Kock, Sumatra. (Jacobson, 1177.)

*P. moeschi*, For.

♂ (Hitherto undescribed) L. 5 mm.

Legs, black, insertions of antennae, and border of mandibles, brown. A few hairs on mandibles and anterior border of clypeus, and apex of gaster; a row of bristles under first joint of tarsi; a fine scattered pubescence on femora, tibiae and gaster; otherwise glabrous. Mandibles with five teeth. Clypeus strongly arched, not carinate, the lateral anterior border convex with a central projecting portion, occupying rather more than one-third of the whole anterior border, with a crenate edge ending in a tooth at each side. Frontal area broadly triangular, indistinct. Frontal carinae sinuate, equally wide in front of and behind articulation of antennae. Head as long as broad, widest at eyes, which are prominent and placed at the posterior angles; occipital border convex. Antennae very long, reaching to base of gaster.

The scape extends almost two-thirds of its length beyond the occiput. All funicular joints long and narrow, the 2nd shorter than the 1st or 3rd. Pronotum with rounded shoulders. Promesonotum convex in both directions, the mesonotum bluntly bordered. Thorax constricted and slightly impressed at mesoepinotal suture. Base of epinotum nearly twice as wide as long, barely half as long as declivity, with two long horizontal spines; slightly directed outwards, thick at base, almost as long as the declivity. Legs long.

Node from the side more or less conical, from in front slightly wider at apex, sides straight; the two fine spines are horizontal, more widely spreading proportionately than the epinotal spines, nearly as long as the space between their bases.

Shining; mandibles with scattered punctures and finely striate at base. Rest of body with a fine ground reticulation, which on the promesonotum has a circular direction, and on scale and gaster is more or less transverse.

Fort de Kock, Sumatra, 1921. 920 metres. (E. Jacobson, 1176). Type W.C.C. Coll.

There is little doubt that this species is the ♂ of Forel's *P. moeschi* from Sumatra (*Zool. Jahr. Suppl.*, xv., Band, 1912, ♀). It agrees very well with Forel's description, allowing for sexual differences.

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### The Horne Sale.

The first portion of the collection of British Lepidoptera formed by the late Mr. Horne of Aberdeen, comprising the Rhopalocera, was disposed of at Steven's Auction Rooms on Tuesday, January 30th last.

The collection was rich in remarkable aberrations, many of which were from the "Webb" and "Farn" sales, and was of very large extent, having been formed on geographical lines, there being long series of species from various localities in Great Britain and Ireland. Two cabinets one of 68 and the other of 18 drawers were required to contain the insects. The sale was well attended, there being several well known collectors from the North intent upon securing some of the treasures offered, whilst amongst the regular buyers several new names were responsible for substantial investments. The interest of a famous South of England collection whose owner is in India, were capably looked after by a well-known professional expert. There were no fewer than 538 lots and the total amount realised, including the 68 drawer cabinet, amounted to about £1,265, in my opinion a very satisfactory result. The "Webb" sale realised about £1,400 and the "Farn" sale about £1,350, but each of these collections contained a larger number of remarkable aberrations. The prices of insects purchased at recent sales were generally maintained, but there were many exceptions, and this was not surprising to the writer as in former sales these insects were undoubtedly too highly valued. It will be sufficient to refer only to the specimens which were most keenly competed for in giving details of the prices obtained.

A fine variety of *Papilio machaon* with large blotches and diffused band, bred in 1916, realised £11. Two lots each of 10 pink suffused *Pieris brassicae* with others 32s. 6d. and 40s. A large number of yellow lemon *Pieris napi* (nearly 50) sold in small lots of 3 to 7 with others, brought from £3 to £4 per lot. Specimens of female *Euchloë cardamines* blotched more or less with male colouring realised £1 12s. 6d., £2. 2s., £3, £3 3s., £3 5s., £3 10s., £5 and £6. Seven *Pontia daplidice* 20s. to £2 5s. each. Lot 48, a fine gynandromorphic *Gonepteryx rhamni*, went very cheaply for £3 10s. The long series of *Colias croceus (edusa)* and *C. hyale* brought satisfactory prices, and among the former a golden orange male ab. *chrysotheme* brought £3 5s., and one clouded with black on all wings £4. Two suffused male *Dryas paphia* made 35s. and £4 4s. respectively, and an example with cell blotched black, banded and with rayed hindwings £6 10s.

Lot 85, a female broadly rayed and suffused with black, £5 5s., and one (lot 86) with large confluent spots forming bands, £3 10s. Another with forewings mostly black, with black and rayed hindwings, £6 10s. Lot 90, a very fine specimen almost exactly similar to Lot 85 already mentioned, but with the black of a deeper shade, brought the very satisfactory price of £13. Lot 93 represented an old friend, the well known entirely black *valezina* from the "Farn" collection. Keen competition obtained the price of £18, being one pound more than realised at the "Farn" sale when it was taken North by Mr. Horne, and it now returns to the South.

Lot 96, a beautiful bred gynandromorph, which aroused much interest, the left side being true *valezina* and the right side partly *valezina* and partly ordinary male, was not dear at £17. Lots 91 and 92, containing a female with cuneiform markings in hindwings and one of the curious forms, which appear to be the transition stage between the type and *valezina*, £1 12s. 6d.

Lot 101, an *Argynnis cydippe (adippe)*, with large silver blotches at base of underside, West Wood, Kent, was obtained for £4 15s., presumably a bargain, as it realised £11 when last sold at auction. Lot 108, a dark and clouded *Argynnis aglaia*, taken by Mr. Horne at Balmoral, brought £7, and lot 109, a very beautiful melanic specimen, also of Horne's taking, £14. Lot 119, a pale golden *Brenthis selene*, made £3 10s., and one veiled with black, £7. Lot 121, a *B. selene* without discal markings, with heavy black dashes round outer border, was a remarkable aberration and probably unique. This was one of the best things in the sale, and was well competed for, realising £17. Lot 122, another beautiful aberration clouded with intense black and in perfect condition, £14, and a white or cream form £4 10s. a remarkably good price. Lot 124 a dark specimen from the "Webb" sale fetched £5, a depreciation of 30s. Lot 129, a pretty rayed underside, £5 10s. The *Issoria lathonia* were sold in pairs varying in price from 35s. to 47s. 6d. Lot 147, a nearly black *Brenthis euphrosyne* from the "Webb" series, realised £7, a depreciation of £3 10s.

A cream coloured specimen from the "Webb" collection appreciated from 25s. to £3 10s. The white forms both of this species and *B. selene* all fetched unusually good prices. Lot 150, one of the most curious forms of aberration that the writer has seen, the spotting having developed into zigzag lines, appealed to the buyers because of its rarity and went for £11. Lots 151 and 152, melanic specimens from the "Webb" and "Farn" collections, realised £6 10s. and £7 respectively, each having depreciated to the extent of 30s. Lot 156, a fine rayed underside, was well worth £8 10s.

There were no very extreme vars. among the *Melitaea cinxia* and *M. athalia* except an ab. *navarina* of the latter species, which was bought for £4. There were very long series of *M. aurinia (artemis)* from various localities, and these were sold for from 30s. to £4 15s., the number of insects in each lot varying from 17 to 85.

Lot 190 the very rare silvery white *Polygonia c-album*, taken by the late Mr. Farn and which at his sale realised £21, on this occasion fetched £20. An interesting deep purplish brown specimen with few markings was well worth £6, and several pale and golden specimens were bid up to 50s., 50s., £3 5s., £3 10s., and £3 5s. Among the *Aglais urticae* cream and dark blotched specimens fetched from 30s. to £5 5s. The *Eucanessa antiopa* were sold at 35s. each, but one brought £3 15s. *Vanessa io* with obsolete ocelli sold at 40s., 65s., 22s. and 40s. Lot 231 realised £4, having been sold for £11 at the "Webb" sale. Lot 226, which was auctioned recently at £12 12s., only realised £3 15s. on this occasion. More or less black *Limenitis sibilla* varied in price from 22s. to 55s. and 60s. Lot 264, a fine *Apatura iris* without white bands, brought £8 10s. and a similar one with blue patches only on each of the four wings was got for £9. This specimen realised £16 at the "Mitford" sale. Light golden brown specimens of *Epinephele jurtina* fetched from £2 5s. to £3 each.

Series of *Coenonympha tiphon* from various localities were sold in lots of about 50 to 65, and fetched from 30s. to £4 10s. All the various forms were represented, except the Welsh. There were 15 *Chrysophanus dispar* sold, the prices being £7, £4 15s., £6 6s., £9 9s., £8 10s., £6, £5 15s., £6 6s., £6, £5 15s., £11, £5 10s., £6, £4 10s., and 55s. for each, according to condition. Among the *C. phlaeas*, lot 365, the specimen with large confluent spots from the "Webb" Collection, figured in Barrett, brought £10, a depreciation of £2. There were very long series of all the "blues" each containing the usual remarkable colour shades and extreme underside variations. Lot 402, an underside of *P. icarus* from the "Farn" Collection, fetched £6, and another of the same species from Ventnor, lot 405, £4. Another Lot 406 ("Webb") 35s. These at last sale realised £7, £5 10s., and £4 10s respectively. Lot 415, a true gynandromorph of *Agriades coridon*, only made £5 10s. the exact price it reached at the "Webb" Sale, the low price being accounted for by the want of freshness of the specimen. Lot 417, a fine and very perfect gynandromorph, left side male, right side partly female, taken at Reigate in 1914 by Mr. Quarrington, fetched the good price of £11 10s.

Lot 457, a specimen with buff margins, rayed, etc., reached £9. Lot 433, ab. *syngrapha*, dusted with black and brown on one side, fetched £2 5s. Lot 445, an underside with deep black basal dashes and bands and spotless, brought £4 4s., and an almost entirely white obsolete underside, £2 15s. Lead grey *Agriades thetis* (*bellaryus*) fetched from 26s. to 30s. each, and a beautiful streaked underside, which brought £15 15s. when last sold, was on this occasion obtained for the low price of £6 10s. A true gynandromorph of *Celastrina argiolus* was bought for £7, it having reached £14 14s. when sold at auction two years ago. A cream coloured *Agriades comma* went for 25s., and an underside without markings, figured by Barrett, 35s.

Owing to the late hour at which the sale concluded several of the buyers from the country had to leave to catch trains, and consequently the competition for the later lots was not so keen, and many good bargains were obtained among the "Blues." The 68 drawer cabinet brought the remarkable price of one hundred guineas. I understand that some more *Chrysophanus dispar* will be sold at the sale of the second portion of the collection on February 30th.—S.G.C.-R.

### Life-History of *Pararge hiera*.

By A. SIMMONS.

When collecting at Chamonix during June, 1922, I found *Pararge hiera* locally abundant. They were about on both sides of the valley, up the path to La Flégère, and also on the opposite side towards Montanvers, the latter, however, was probably the most productive ground, the best spot being a rough bank just where the Montanvers railway leaves the second tunnel, at an altitude of 4,500 ft. They were particularly fond of settling on dandelion flowers, but unfortunately were somewhat worn, so I caged two females to obtain ova.

The weather was somewhat cold and broken, but eggs were laid on the blades of grass from June 9th to 16th. The eggs are spherical and creamy white in colour, changing two days before hatching to nearly black. The first larvae appeared on June 20th, and are a dirty white

colour, with a black head, which is very prominent and seems much too large for the size of the larva. After the first moult, which commenced on June 29th, the ground colour changed to a uniform light green, and they lost their black head, which became a little lighter in shade than the general colour, but was still very pronounced.

The second moult took place on July 10th, and this produced very little change except that six very faint white stripes appeared, three on each side, but were hardly perceptible.

The third and final moult took place on July 19th, and again there was very little change in the colour, but the stripes were now more distinct, the head, however, was still very prominent, giving the larva an unhealthy, starved appearance, but this gradually disappeared as they neared pupation.

When full fed the larva is 28mm. long, of a delicate green colour, a little lighter than grass. It is of the usual Satyrid form, tapering towards the anal extremity, with three nearly white stripes on each side; the two on the dorsal area are very close together, one near the spiracles and one midway between the two. The head is much lighter in shade, and though not now so prominent it still appears too large for the larva. It rests in a straight position on its food plant, and when annoyed falls and coils itself into a ring.

When full fed the larvae all attached themselves to the top of the cage and changed to light green pupae, almost the same shade as the larvae. They hung head downwards without any girth or band, and in no case did they attach themselves to the stems of grass. The first pupa appeared on August 3rd, and the last on August 23rd, en route for England, producing a total of 104. The larvae were quiet contented little creatures, bearing their confinement well, and took readily to any grass, but were fed chiefly on *Agropyrum repens*, and I do not think that I lost above four out of the whole brood. They fed both by night and day and no attempt was made to hide during daylight, in fact they seemed to enjoy the late afternoon sun.

I thought that I should get them out during August as a second brood, but not one has showed any signs of changing, and the whole lot are evidently going to hibernate as pupae, a somewhat unusual habit for a Satyrid.

It seems, therefore, that from 4,000 to 5,000 ft. *hiera* is only single brooded, and if a second brood does occur it may be only partial in favourable seasons, and probably at a much lower altitude.

I left Chamonix on June 29th, staying about a fortnight at Martigny, and going on to Bérival on July 15th. I can claim, therefore (except the fortnight at Martigny, which was not very hot, only on four days did the temperature rise above 70°), to have fed the larvae under quite natural conditions, Bérival 5,000 ft. being about the same altitude as where the parents were taken at Chamonix, and this may perhaps account for my success in rearing such a large number.

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### Description of Pupa of *Pararge hiera*.

By G. T. BETHUNE-BAKER, F.L.S., F.Z.S., F.E.S.

Mr. A. Simmons has asked me to describe the pupa of *Pararge hiera* which he found commonly at Chamonix. Since I wrote the description I have had three imagines emerge out of six chrysalids sent me.

One was shrivelled and I do not know the date of its emergence, but it was dead on December 30th last, on which day my wife told me there was a butterfly on the landing, which I found to be *P. hiera*. Then on the following day another emerged. Both these were quite perfect. The pupae were put in a gauze cage just by an east window, which was open all day. The other three pupae show no signs of maturity, but are the same clear green as they were on the day I received them. Description of pupa:—

Pupa, pale apple green, with very little yellow in it, wing cases slightly greyish with the green showing through. In shape it is thick and rather stumpy, with apparently no power of movement (I have seen no attempt at movement). It is very deeply rounded from the dorsum of the sixth abdominal segment to the cremastral attachment, which is situated right on the venter; the wing cases extend to practically the fifth abdominal segment. To the naked eye the pupa looks smooth, but with a hand lens it is seen to be finely shagreened all over with fine irregular whitish elevations, the wing cases being broadly lined longitudinally as well. The antennae extend to the fifth abdominal segment, and the eyes are on the ventral surface. The thorax has a central longitudinal narrow projecting ridge, and it is sharply angled laterally near the middle, but rather nearer the collar at the juncture with the wing cases, and again at the front apex above the eyes, giving it a square form slightly angled forwards above the eyes.

The spiracles show as circular depressions with central slits, above the spiracular row is a dorso-lateral row of simple whitish tubercles. The length is 15½mm., the greatest diameter of the abdomen is 5mm. at the fourth abdominal segment, and the diameter of the thorax at the angled shoulders is 5¾mm.

## NOTES ON COLLECTING, etc.

LATE APPEARANCE OF LEPIDOPTEROUS LARVAE IN 1922.—As a result of beating birches and beeches in the Box Hill district on October 10th, 1922, the following larvae were obtained:—*Hylophila prasinana* (1), *Drepana lacertinaria* (3), *D. falcataria* (1), *D. cultraria* (several), *Phalera bucephala* (several), *Dasychira pudibunda* (1), *Lophopteryx camelina* (several, many of them quite small), *Pheosia (Notodonta) dictaeoides* (several, mostly full fed), *N. dromedarius* (2, half grown), *Demas coryli* (1), *Triana (Acronicta) psi* (1), *Acronicta leporina* (2, full fed), *Amphidasis betularia* (several, in both early and late stages), *Tephrosia crepuscularia* (1), *Ephyra (Zonosoma) linearia* (3), *Cabera pusaria* (1), *Cidaria corylata* (several), and some Tortrix larvae—not a bad result considering the date. The young larva of *Lophopteryx camelina* and the partly fed larva of *Notodonta dromedarius* did not arrive at maturity, possibly owing to the difficulty of obtaining their food plants in anything like suitable condition. All the larvae of *Amphidasis betularia*, however, fed up and pupated, the last but one going down on November 27th, and the final survivor on December 10th; surely a record date. The pupa resulting from the larva which went down on December 10th is small, but perfect, and it will be interesting to see whether the emergence of the imagines of this and some of the other *A. betularia* is retarded to any extent.—A. RUSSELL, Wilverley, Dale Road, Purley. January 8th, 1923.

ABERRATIONS OF RHOPALOCERA IN EAST TYRONE, 1922.—The following aberrations of common butterflies occurred in this district during the past summer, which was remarkable for the persistence of dull cloudy weather, accompanied with a slight but increased rainfall; May and September being the only months in which there was any continuous fine weather, and then only for a very short period.

*Pieris brassicae*.—On September 15th a female of a pale yellow colour was captured.

*Pieris napi*.—Several females of the summer emergence have three distinct spots on the posterior wings above; the banded form, with the inner marginal streak and discal spots united, was more frequent than usual.

*Euchloë cardamines*.—Two females in June, with two short black lines below the discoidal, between nervules 2 and 3, on underside of forewings, ab. *dispila*, Raynor? I find that Sir C. Langham of Tempo Manor has a comparatively large number of this form (some of which are very distinctly marked), captured in his own neighbourhood (Co. Fermanagh). A male with the usual strongly marked spots on hindwings, characteristic of the race *hibernica*, was transformed into conspicuous black blotches; this gives the margin of the wings a scalloped appearance.

*Epinephele jurtina*.—A male from Lough Fea, in July, with an ocellated spot near the inner angle of the anterior wings above.

*Aphantopus hyperantus*.—Several females of this species, with the ocellated spots and pale rings on upperside as large as those beneath.

*Coenonympha pamphilus*.—In a remote spot on the hills I captured a male aberration with two distinct black spots on the upperside of posterior wings along the border near the anal angle; this specimen has also a strongly defined black suffusion on the margins; a similar variety is mentioned by Barrett; and the late Rev. Frank E. Lowe, M.A., records several examples from Orta (*Entom. Record*, vol. xxii., 1910, page 23).

*Rumicia (Chrysophanus) phlaeas*.—A male with wedge-shaped spots on forewings, very similar to the variety figured in South's *British Butterflies*, plate 101, fig. 11.

*Polyommatus icarus*.—A male example with underside var. *postico-obsolata*, Tutt, the forewings with four submedian spots; male and female underside forewings with a conspicuous white wedge-shaped streak from the discoidals and tapering to a point towards the base, an aberration which has, I believe, not hitherto been noted in this species.—THOMAS GREER, Stewarstown, Co. Tyrone. January 20th, 1923.

## CURRENT NOTES AND SHORT NOTICES.

The "Verrall" Supper took place on January 16th, and was as regards numbers the most successful hitherto held. Over 120 guests sat down to a capital repast in the King's Room at the Holborn Restaurant, with Mr. J. E. Collin, the able managing director of the Association of Entomologists, under whose auspices the gathering is arranged, in the chair. The following is a list of those who accepted invitations:—B. W. Adkin, R. Adkin, H. E. Andrewes, H. W. Andrews, E. B. Ashby, S. R. Ashby, T. H. Ashe, F. Balfour-Browne, E. C. Bedwell, G. Bethell, G. T. Bethune-Baker, K. G. Blair, L. A. Box, M. Burr, S. Blenkarn, R. T. Bowman, E. Brunetti, P. A. Buxton, A. Cant, F. B. Carr, J. W. Carr, G. C. Champion, C. A. Cheetham, W. E. China, E. A. Cockayne, J. E. Collin, J. Collins, Col. Monckton Copeman, Col. S. Curtis, Dr. Davidson, Dr. F. A. Dixey, A. W. Dods, H. Donisthorpe, L. E. Dunster, J. H. Durrant, F. W. Edwards, J. Edwards, Stanley Edwards, Dr. H. Eltringham, L. T. Ford, J. S. Fox-Wilson, G. E. Frisby, F. W. Frohawk, J. C. F.

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The action of the Council of the Entomological Society of London some two years ago, in taking measures to acquire a permanent premises for their library and meetings, has proved to be very popular among the Fellows of the Society, for we find on the list of donors to the housing fund the names of about one-third of the membership. Even fellows permanently located abroad have contributed.

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## SOCIETIES.

### THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

November 9th.—NEW MEMBERS.—Mr. B. Jobling, 52, Charleville Road, W. Kensington; Mr. C. H. H. Stokes, 107, Queen's Road, Upper Norwood; Mr. G. E. Bryant, 163, Gloucester Terrace, W. 2; Mr. E. Meek, 119, Kempton Road, E. Ham; and Lieut. J. C. Seabrook, F.E.S., 6, Warwick Place, Belgravia, were elected members.

EXHIBITS.—The President exhibited numbers of living *Ptinus tectus* (Col.), and a spray of oak showing the operations of *Attelabus nitens* (Col.), preserved with imagines.

Mr. A. A. W. Buckstone, long bred series of *Spilosoma menthastris*, from Broadstairs, including an example resembling *S. urticae* in texture and marking.

Mr. Hy. J. Turner, the *Coenonympha* forms of *C. iphis*, *C. arcania*, var. *satyrion* and var. *darwiniana*, and gave an account of the variation and the distinctions between them. The series were from many localities in the Palaearctic Region.

Messrs. O. R. and A. de B. Goodman, short series of the same forms.

Mr. W. J. Lucas read a paper, "The second Maxillae (labium) of the Paraneuroptera (Odonata), more especially as the mask of the Naiad Stage," and illustrated his remarks with a series of lantern slides.

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## REVIEWS AND NOTICES OF BOOKS.

LE MONDE SOCIAL DES FOURMIS DU GLOBE.—By Dr. Auguste Forel,

Geneva. Librairie Kundig, Editeur. Tome 2nd, 1922. Pp. I.-III. + 184; 1 coloured plate, 3 black and white plates, and 38 text figures.

The second volume of Forel's *Monde Social des Fourmis* deals with Sensations, Physiology, Ants and Plants, Hosts, Parasites, and Nests. Chapter I., after some general remarks on the sensations of ants, the author divides them into *Chemical Senses*, under the headings Taste and Smell; the *Sense of Motion* (by which ants measure the distance they have travelled), and *Equilibrium*; *Other Sensations*, general and local; *Physical Senses perceived from a distance*, Temperature, Hearing, Sight, and sense of perceiving light. There is nothing new in all this (except perhaps the method with which it is dealt); most of the views and experiments of other myrmecologists being discussed. I might mention in connection with the sense of hearing that I tested ants in captivity with the Galton-Edelmann whistle in 1910, a perhaps more highly specialised and scientific instrument than had been used before for this purpose, the results bearing out the same views as those expressed by Dr. Forel. Chapter II., *Physiology and Psychology of Ants*. A number of different phenomena dealing with the study of the functions of the organs, and the study of the mind are touched on—the effects of starvation, marriage flights, the absorption of the wing muscles by the blood after dealation, the pumping stomach, the glands, the language of ants, visual memory of place and time, etc. Chapter III., *Ants and Plants*, and *Symbiosis*. A general view of the relation between ants and plants, such as the gall-like roots of *Myrmecodia* and *Hydnophytum* inhabited by ants; leaves cut by the *Attini* for their fungus gardens; the stems of *Triplaris*, *Cecropia*, and spines inhabited by *Pseudomyrminae* and other ants; several different species of ants amicably inhabiting the same plant; myrmecochorous seeds; *Aristida* (ant rice) and other grain cultivated by *Pseudomyrminae*, etc. *Nepenthes* sp. which digests ants in its pitchers; and *Polytrichum* which grows over and eventually obliterates hillock-nests of ants, are also referred to. In 1910 I pointed out how many of the *rufa* nests at Nethy Bridge were being extinguished by the undergrowth. Chapter IV., *Myrmecophilous Animals and Mimicry*. The author recapitulates Wasmann's four divisions of Myrmecophiles, and then divides the chapter up into the following heads—Mimicry: under this heading he refers also to the similarity of certain insects to green leaves, dead branches, etc. (I should prefer to call this Protective Resemblance); Trichomes, Canaux pores; Offensive or aggressive methods; Rapports internationaux (this is really the behaviour of myrmecophiles (and the ants) when introduced to ants of species other than those of their own proper hosts); Symphiles: under this heading he discusses the question of the production of Pseudogynes, and is evidently in entire agreement with Father Wasmann's celebrated theory. Forel states the presence of *Atemeles* (and of *Lomechusa*) coincides with that of the pseudogynes. This, as I have pointed out, is not so in the Highlands; moreover, it is a positive fact that though *Atemeles emarginatus* is common in England, not a single pseudogyne of *Formica fusca* has ever been found here. It is also stated that though the relations of the cause with the effect is unknown, his own observations and those of his colleagues confirm Wasmann's theory; "*Atemeles* and *Lomechusa*, cause," "Pseudogynes, effect." Professor Wheeler and I, however, have both expressed the view that the presence of these beetles is neither always, nor the only, cause of the production of pseudogynes. Synoques:

under *Dinarda* he repeats the view that this beetle waves the tail under the face of the host because the latter is unable to grasp its body; but I have shown that the reason is to give off the secretion with which the Myrmedonias and other myrmecophilous Staphs protect themselves when attacked by their hosts. Synechthres; Cas particulars: dealing with *Lomechusa*, *Thorictus*, the *Paussidae*, etc. Under the last named beetles the unfortunate statement occurs that their larvae and pupae are quite unknown! In 1907 Adam Bøving described and most beautifully figured the larva and pupa of *Paussus kannegieteri*, Wasm., and in 1918 Wasmann described and gave photographs of the larva of *Pleuropterus dohrni*, Rits. Under *Diptera* the food of the larvae of *Microdon* is said to be unknown; whereas in 1912 I demonstrated by experiment of what it consisted. Chapter V., *Parasites, Toxicology, and Monstrosities of Ants*. I am surprised to find the larvae of *Clythra* are classified under Ectoparasites! An ectoparasite is a creature which fastens itself on to the body of its host, which *Clythra* larvae certainly do not. The myrmecophilous mite which fastens itself on to the strigil of an ant is not, as is stated here, the *Uropoda ovalis* of Janet, but the *Uropoda philoctena*, Janet = *Urodiscella philoctena*, Troues. The *Uropoda ovalis*, Janet = *Uropolyaspis hamuliferus*, Mich., fastens itself to the femur of the second leg of its host. Janet's paper was written in 1897 (in it he referred to a mite as "*Neoberlesia* sp.?" which we now know to be *Sphaerolaelaps holothyroides*, Leon.), and of course much has been written and discovered about the myrmecophilous acari since then. Under *Hermaphrodites* our author mentions that in 1903 Wheeler gave a list of all the cases of Gynandromorphs then known. Wheeler, however, published a second list in 1913, bringing the total of all such cases up to 30. Donisthorpe published a list in 1915, bringing the total up to 34, and Crawley one in 1920 with a total of 43. Chapter VI., *The Nests of Ants*; under various sections dealing with all kinds of ants' nests and their construction, contains a number of very nice figures and photographs of nests from all over the world. Under *Carton Nests* it is stated that Brun had observed that *Lasius umbratus* also made carton. This fact, however, was first discovered by me in 1912 (as is pointed out by Dr. Brun himself in his paper in 1913), and it is also further described, and a photo given, in *British Ants*, 1915. The plates and figures in this volume are as good as those in the preceding one, though many of them are of course reproductions from other works. Unfortunately in our copy Plates ii. and iv. have been bound upside down. Plate i. is beautifully coloured, and represents various cases of mimicry of ants by other insects, and ants.

The chief criticism I have to make is that the work is not up to date; the writings of some of the more modern workers (and indeed many of the later papers of the older writers also) being ignored. In a general work on the ants of the world, a reader who is not a specialist, but takes an intelligent interest in the subject, would wish to look up any part of it, to gather what are the latest views and discoveries up to the date (or near it) of the publication; and not only what was known in say 1903, or earlier still! The book is of course well written, well printed, and interesting, and I wish sincerely it was not necessary to find the above faults with it. A review of the first volume may be found in *Ent. Record*, 33, 59-60 (1921).—HORACE DONISTHORPE.

CORRECTION.—On page 18 of the January number the locality for *H. simplana* should have been Kent and not North of Scotland.

**Subscriptions for Vol. XXXV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1923.]**

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*Duplicates*.—*Cinxia*, *Bellargus*, *Coridon*, *H. Comma*, *Lineola*, *Galathea*, *Moneta*, *Nupta*, and many others. *Desiderata*.—*Blandina*, *Irish Icarus*, *Carmelita*, *Cuculla*, *Gonostigma*, *Ashworthii*, *Templi*, *Australis*, *Undulata*, *Smaragdaria*, *Testacea*.—*W. Gifford Nash*, *Clavering House*, *Bedford*.

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## MEETINGS OF SOCIETIES.

**Entomological Society of London**.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. February 21st, March 7th and 21st.

**The South London Entomological and Natural History Society**, *Hibernia Chambers*, *London Bridge*. Second and Fourth Thursdays in the month, at 7 p.m. 1923, February 22nd, *Lantern Evening*. March 8th, Paper by *Br. Fremlin*.—*Hon. Sec.*, *Stanley Edwards*, 15, *St. German's Place*, *Blackheath*, *S.E.3*.

**The London Natural History Society** (the amalgamation of the *City of London Entomological and Natural History Society* and the *North London Natural History Society*) now meets in *Hall 40*, *Winchester House*, *Old Broad Street E.C.2*, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, *W. E. GLEGG*, 44, *Belfast Road*, *N. 16*.

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## Notes on the Psychides.

By the Rev. C. R. N. BURROWS, F.E.S.

It may be remembered that in 1917 (*Ent. Record*, vol. xxix, p. 69.) I ventured a preliminary note upon this puzzling group of *Lepidoptera*. During the long interval which has intervened, I have been engaged in collecting material, and trying to clear up the many difficulties which surround the study. Since this preliminary note I have reprinted (*Ent. Record*, xxxi., p. 165) Tutt's catalogue of the Palaearctic species, from *British Lepidoptera*, vol. 2, with a few minor alterations which appeared to be necessary. I have in the meanwhile lost several friends, Dr. Chapman himself, who first interested me in the study, and passed on to me a large store of material, F. G. Whittle, Arthur Bacot, and the Rev. F. E. Lowe, all active in supplying me with specimens and information. I also owe a debt of gratitude to the Misses Chapman, who after their brother's death handed over to me all the remaining *Psychides* which they found in his innumerable store-boxes and drawers. To those who are still helping me, I shall hope to tender earnest thanks later on.

I stated in my original note that my object was to approach the subject from the standpoint of the "genitalia." My great drawback has been the difficulty of obtaining sufficient material. We all, I believe receive with reserve separations based upon single specimens, unless the distinctive features be so strongly marked as to render doubt upon the point to be out of the question. The limited material which I have been enabled to accumulate has severely hampered my progress, and frequently made it difficult for me to arrive at a definite conclusion.

In several instances I have found upon receiving further specimens, that my first opinions have been erroneous; and, while I am tempted to suppress several names as species, I have also come across several evidently unrecognised forms, which have been passed as known. I have been successful in securing (so far as names go) at least ninety out of 143 species listed by Tutt, besides several not included in his list. There is however a proportion of single specimens which I am compelled to receive with considerable uncertainty, until their identity is confirmed.

When I took up the study of the *Psychides*, my object was primarily to discover how many species occur in Great Britain. I soon found that I should have to extend my examination to the whole of the Palaearctic fauna, if only to make sure of the correct identification of our species. I also found that it would be extremely difficult to obtain British material, this, as well as Continental material, had often to be bought. I realized that although I could find in my immediate neighbourhood at least eight out of the twenty-one reputed British species, my correspondents did not seem to be so fortunately circumstanced, and even of very abundant species, which I found in unlimited numbers, the specimens which I have received have often been limited to ones and twos. This is more extraordinary inasmuch as the wingless condition of the mother would appear to postulate concentration of the offspring.

The *Psychides* would appear to be in considerable demand at the auction sales. The names appear in italics, and the lots containing

them fetch large money. One would be tempted to imagine that the purchasers buy "names" rather than insects, as some curious facts have emerged, during the course of my accumulation of the British Psychides at such places. I have in my collection a series of six insects purchased at the "Farn" sale labelled "*anicanella* Mitford 6 males, females and 3 cases." I seem to have a sort of recollection of these specimens. Possibly the note to p. 287 in Tutt's *British Lepidoptera* may refer to them. I have no means of telling whence they came. One bears the label "Mitford," the rest have none. Now Bruand named this insect, but only the female was figured. No one appears to have identified Bruand's species to this day. These six specimens proved to be four *Epichnopteryx pulla*, and two *Fumea casta*, that is to say, the two very commonest British species of the *Psychides*. So much for italics! I feel glad that I have removed these from being a further temptation to acquisitive, yet ignorant, collectors. A second instance of the same kind presents itself to me. At the "Webb" sale I ran down a series of insects which had haunted me for some time. This consisted of two lots of 6 and 7 specimens, each lot being accompanied by a label marked in pencil "N.S. Tutt, p. 314." They had appeared in the "Burney" and "Briggs" sales before they arrived at the "Webb" collection. They were identified as Mitford's. I have from Chapman a very similar specimen named *mitfordella*. All these specimens are remarkable for the evidence of past neglect, in the shape of lost bodies, antennae, and legs, with the wings reduced to mere rags. I call them lots "A" and "B." The six "A" specimens had two bodies between them, while the 7 "B" had not even one. This of course was a great disappointment to me. The "A" specimens appear to be ordinary *Fumea casta*, while the "B" lot differ slightly therefrom, but are not *mitfordella*, as diagnosed by Chapman.

So far for the "rare species" which I have succeeded in obtaining at sales. Now for such as I have not secured.

*Solenobia triquetrella*, Hb., appears now and again in the catalogues. I have never managed to secure a reputed "British" specimen of this insect. Again the charm of a name appears to act.

Is there any proof that this insect occurs in Great Britain? I have managed to secure specimens of the males of all the named *Solenobiae*, except the somewhat hypothetical, *S. suifunella*, Christ., *S. fumosella*, Hein., and *S. pallida*, Staud., excluding *S. lichenella*, L. (which has no male), I have examined the final segments of the remainder, accepting the names under which I received them, and I find that save for the size, there is no obvious difference. The imagines also are separated almost entirely by size, colour, and (always obscure) markings. The females of the genus however, do show some difference, in the number of joints to the tarsi. Females of the *Psychides* are often difficult to procure. Collectors usually neglect to preserve this sex, and also the cases. I have managed however to secure records of a certain number, which I now give:

<i>S. inconspicuenta</i> , tarsal joints (of the three legs)	...	...	4-4-4
<i>S. lichenella</i> ?, British specimens, tarsal joints (of the three legs)	...	...	4-4-4
<i>S. cembrella</i> var. <i>pineti</i> , tarsal joints (of the three legs)	...	...	5-5-5
<i>S. triquetrella</i> , tarsal joints (of the three legs)	...	...	5-5-5
<i>S. mannii</i> , tarsal joints (of the three legs)	...	...	5-5-5
<i>S. clathrella</i> , tarsal joints (of the three legs)	...	...	5-5-5

Judging by the female legs, there are here certainly at least two species.

Tested by the male antennal joints (always difficult to count) the facts stand thus :

<i>S. inconspicuellā,</i>	Joints 26,	expanse of wings, Tutt, 12.5 mm.
<i>S. nickertlii,</i>	„ 18, ?	(C.R.N.B.), 11 mm.
<i>S. wockii,</i>	„ 27,	from Tutt, 11.13mm.
<i>S. pineti,</i>	„ 27-28,	from Tutt, 13.14mm.
<i>S. triquetrella,</i>	„ 22,	from Tutt, 14 mm.
<i>S. manni,</i>	„ 28-32,	from Tutt, 15.5 mm.
<i>S. clathrella,</i>	„ 28,	from Tutt, 16-17.5mm.

It would seem from this that the number of joints may depend upon the size of the specimens under examination.

As to the cases, there is very little difference discernable except in the very much inflated male case of *S. clathrella*, otherwise it would appear to be a mere question of size, colour, and material. I find in Mucking, females with four, and also with five, joints to the tarsi. Hence I judge (as Mr. Metcalfe pointed out to me), we have besides the “*inconspicuellā* group” the “*triquetrella* group.” As no males appear, it is impossible to refer to that sex, so I have to be satisfied that I collect (1) *inconspicuellā*, or *lichenella*, and (2) *triquetrella*, *pineti*, *manni*, or *clathrella*.

To proceed. Another species which appears in the sale catalogues is *Bankesia conspurcatella*, Z. It would seem that there is some confusion here, based upon an old mistake of Stainton's. In March of the year 1846 Mann captured in Tuscany 20 males. Submitted to Zeller (1850) they were named by him *conspurcatella*. One of these specimens is now in the Walsingham-Zeller Collection, in the British Museum, London. Whether Mann gave Zeller more than this specimen I do not know, and the whereabouts of the 19 remaining specimens is unknown, at least to me. In March of the year 1867 Mr. H. A. Swinton captured at Warsash House\*, Southampton, a Psychid which he sent to Stainton to be identified. Stainton had received in 1861 specimens of the same insect from M. Fologne, taken near Brussels. He was on the point of describing the species as new, when he came across Zeller's description of *conspurcatella*, and from this description alone, never, it would appear, having seen Zeller's or Mann's specimens, identified the British and Belgian species therewith. (*Entom. Ann.*, 1868, p. 127, fig. 3.)

In 1899 Walsingham (*Entom. Record*, xi. p. 256), having Zeller's specimen before him, separated the Swinton-Fologne species as distinct from Zeller's, and named it *staintoni*, an undeserved honour surely after Stainton had made so careless an error. The specimens offered for sale under the name of *conspurcatella* are then all *staintoni*, and are simply records of the neglect of the owners to notice Walsingham's correction of Stainton's mistake. In 1900 Tutt was enabled to publish full particulars of the life-history of *staintoni*, thanks to the capture of a large number at the original locality by E. R. Bankes in 1892.

No later takings of *conspurcatella* have been recorded.

(To be continued.)

\* Until now diplomatically concealed under the record “On the shore of Southampton Waters, opposite Calshot Castle” which very descriptive account led me to persuade my friend The Rev. J. E. Tarbat, of Fareham, to devote time and energy to the investigation of the whole of the shore of Southampton Water without success. Mr. Swinton later gave me full information, but Mr. Tarbat has not so far succeeded in tracing the insect.

## Digne, etc., 1922.

By DOUGLAS H. PEARSON, F.E.S.

It had long been a reproach that I had never visited Digne, which is sometimes spoken of as the Mecca of the Continental butterfly hunter, and this reproach my brother and I resolved to remove.

Leaving London on the morning of July 14th we arrived at Clelles before midday of the 15th in a pouring rain, and after some search discovered our registered baggage on the edge of a ditch beyond the platform, where it had been thrown from the van, much to the detriment of the contents, as we discovered later. We stayed at Clelles until the 18th, and picked up some useful things. The neighbourhood of the viaduct appeared to be the best ground, and here we were pleased to take two or three *Melanargia galathea* var. *leucomelas*, which we had hitherto worked for in vain. On the patches of thyme were a number of *Klugia* (*Thecla*) *spini* and *Nordmannia ilicis*, most of the latter being strongly marked var. *cerri*. One *Polyommatus admetus* var. *ripartii* was taken, and a few *Scolitantides baton* in one spot only, but *P. damon* was very plentiful in some of the meadows. Near the viaduct *Melitaea parthenie* was flying freely, and as it has usually been my luck to find *M. athalia* plentiful and *M. parthenie* very scarce, I brought home a fair number, but am disgusted to find that many of them appear to be *M. athalia*, and am more puzzled than ever with these two species. Most writers seem to rely upon the colour of the palpi to distinguish one from the other, so we turn to the authorities. Kirby, in *Butterflies of Europe*, says of *athalia*, "the palpi are pale yellow and are only occasionally reddish at the tips," and of *M. parthenie*, "palpi as in *athalia*." Wheeler says of *athalia*, "palpi dark brown above," and of *parthenie*, "palpi golden brown above with a dark line below." Kane does not mention the palpi of *athalia*, but of *parthenie* says, "palpi yellow above." Seitz says of *athalia*, "in doubtful specimens the palpi are a sure guide, which, when viewed from above, do not show any red hairs, but blackish ones, slightly intermingled with yellowish hairs beneath." He does not mention the palpi of *parthenie*. Wheeler describes the underside of *athalia* as "hindwing inner dark band generally broader at costa than in *parthenie*," but Seitz says, "the markings of the underside are usually somewhat coarser, but too variable to afford any distinguishing character." All of which is about as clear as mud! Many of these Clelles specimens have the wide median band of *parthenie* but the dark palpi of *athalia*. Would one be right in naming all specimens with yellow hairs above *parthenie* and dark ones *athalia*? Further light would be much appreciated.

On July 19th we moved on to Digne and stayed there until the 29th. Butterflies generally were not abundant, and though there was a fierce sun on many days it was accompanied by a cold wind, which may have accounted for the scarcity. We only saw two *Papilio alexanor*, one of which was netted, but *P. podalirius* was fairly common. Female *Polyommatus meleager* were very scarce, and we only managed to take eight during our stay, one being ♀ var. *steeveni*. *Satyrus briseis* was not out at Clelles, but we took a few at Digne, and plenty later on at Briançon, and one *S. fidia* was netted, but was too badly torn to keep. We were pleased to again meet with *M. galathea* var. *leucomelas*, and took four in the corner of one meadow. *P. admetus* var. *ripartii*

was fairly common and we took a nice series as it was a new capture for me. We also took a nice little series of the summer form of *Leptosia duponcheli*, which was flying with *L. sinapis*, both being in good condition. Mr. Rowland-Brown, in 1912, pointed out that *L. duponcheli* can be distinguished from *L. sinapis* by the antennae, in *L. sinapis* the base of the club head being white in front, which white patch is wanting in *L. duponcheli*. When using a thin black net the two species are very easy to distinguish on the ground by this white patch. The wings are narrower and squarer in the male *L. duponcheli*, but in the female seem much the same shape as in *L. sinapis*. The dark marking on the costa of the forewing also seems less diffused than in *L. sinapis* and the ground colour not such a pure white. The undersides are practically pure white with a yellowish patch on the tip of the forewing, and are quite different from the specimens I have seen of the spring brood. *S. actaea* was a species which was new to me, and was therefore welcome, and with it *S. cordula* was flying, some of the ♀s being still in good condition. *Coenonympha dorus* was fairly plentiful, and a very small race of *P. icarus*, which might easily be mistaken for *Arícia medon* (*astrarche*). Lavender is much advertised as a bait for butterflies, but we did not find it especially attractive, and the patches of thyme were generally much better attended.

On July 29th we left Digne for Briançon, which I last visited in 1911, and there we stayed for two days, and were pleased to meet with a few *Erebia neoridas*, which we had not found at Digne. *S. briseis* was here plentiful and easy to capture, and we netted a few more *S. actaea* and three *P. admetus* var. *ripartii*.

On August 1st we motored up to Lauteret and stayed there until the 7th. On the evening of our arrival we had a heavy thunderstorm and torrents of rain, but on August 3rd walked up to the Col de Galibier and had a good time with *Erebia glacialis* var. *pluto* on the old road which goes over the top of the tunnel at about 9,000 ft. There were a number about, but, as usual, the number seen was much greater than the number taken, as they flew over steep screes. The view from the top, with Mont Blanc in one direction and Monte Viso in another, was very fine. On the slopes near the hotel we took a few *Agriades theristes*, which I had not previously taken, but they were very scarce. On August 6th we walked up the slopes of Galibier, but there was such a howling wind that we finally turned back before reaching the ridge aimed at, as walking was difficult. In a more sheltered valley on the way down we hunted the grass heads, and were well rewarded by a nice series of *P. erös*, *Vacciniina optilete*, *Latorina orbitulus*, and a few *Albulina pheretes*, etc., one seed head being occupied by six *A. niobe* and two *B. pales*. One ♂ *Melitaea cynthia* was also taken. *Zygaena exulans* swarmed in thousands on the hillsides, but this was the only place where "Burnets" were at all plentiful. At Clelles a few *Z. transalpina* were met with (and here a *transalpina* was taken in copula with *purpuralis*), and at Digne five *Z. fausta*, one *Z. hilaris*, one *Z. ephialtes*, and a few *Z. carniolica*; probably we were too early for the main crop.

We left Lauteret on August 7th, motored down to Grenoble—a lovely run—and thence straight home, bringing to a conclusion a very pleasant holiday.

**Hippodamia variegata, Goeze.—New aberrations.**

By G. B. C. LEMAN, F.E.S.

**1. ab. harwoodi, n.ab.**

This aberration comprises the unique confluence of spots 1 and 5. Spot 4 is large and only escapes confluence with spot 5 by a very narrow margin. The only other spots present are  $\frac{1}{2}$  and 6.

The type is in the collection of Mr. Philip Harwood, F.E.S., who kindly sent me his specimen, which he took at Little Hadham, Herts, on October 29th, 1911, for identification, and after whom I have the honour of naming it.

FORMULA: 1 + 5, 4, 6,  $\frac{1}{2}$ .

**2. ab. reichei, n.ab.**

*A. mutabilis*, Scriba, var., "Voyage en Abyssinie" par Fruet et Gallonier (*Entom.*) p. 409. 1. (Reiche, 1850): *A. mutabilis*, Scriba. *Mon. Cocc.* I. 40. No. 2. obs., and *Mem. Ac. Imp. Lyons*, XV. 28. No. 2. obs. (Mulsant, 1866).

"1. *A. mutabilis*:—Scriba.—var.

"Variété à six points noirs sur chaque élytre indépendamment de la tache scutellaire, les trois points postérieurs plus gros, réunis en une grande tache avec un point rouge au milieu. Pattes antérieures rouges, genoux un peu obscurs, branches des pattes intermédiaires, base des cuisses et extrémités des jambes roussâtes."

This variety is distinguished from ab. *turkmenica*, Zoubk., by the presence of the red spot in the centre of the large blotch formed by the confluence of spots 4 + 5 + 6.

FORMULA: 1, 2, 3, 4 + 5 + 6 (in large blotch with red spot in centre),  $\frac{1}{2}$ .

**3. ab. colligata, n.ab.**

*A. variegata*, Ws., B.T. II. Cocc. (separat. Abdruck. aus der "*Zeit. für Entom.*" Neue Folge, Siebentes Heft. Breslau. 1879) pp. 5 and 6. 1. 1. k. nec v. *corsica*, Reiche—B.T. II. Cocc. (1885) pp. 12-14. i. nec v. *corsica*, Reiche—*L'Abeille Journ. d'Entom.* (1892) XXVIII. 1. 12. i. nec var. *corsica*, Reiche—Ws., *Deutsche Ent. Zeit.* (1900) pp. 122 and 123. "oder noch 4 mit 1 zusammen," nec "(var. *corsica*)".

"k. P. 1 + 4 gross, bilden eine Längsbinde . . . v. *corsica*, Reiche." [Ws., 1879.]

"i. P. 4 ist gross, nach vorn und aussen gekrümmt, zu letzt mit P. 1 zu einer schiefen Längsbinde vereinigt. Corsica Sardinien . . . v. *corsica*, Reiche." [Ws., 1885.]

This aberration has 13 spots, with 1 + 4 confluent (teste Weise), but it is certainly not the var. *corsica* of Reiche and cannot be confused with the latter.

FORMULA: 1 + 4, 2, 3, 5, 6,  $\frac{1}{2}$ .

**4. ab. bilimbata, n.ab.**

This aberration differs from ab. *limbata*, Fabr., in having the additional spot No. 6.

Fabricius (1781) describes his ab. *limbata* in *Sp. Ins.* II. App. 497. 12 as under.

"12. *Coccinella atra*, coleoptorum disco rubro, limbata. Punctis duobus atris.

"Media. Caput et thorax atra margine albido. Elytra atra ad suturam rubra puncto magno atro. Apex elytrorum rufescit."

Mulsant (1846) in *Hist. Nat. des Col.* under *A. mutabilis*, Scriba, var. C. makes the following observation (p. 41).

"Obs. Ici ce placerait la *Cocc. limbata* de Fabricius, si elle ne devait être rangée même de la liste des variétés de l'espèce qui nous occupe. Elle fut décrite par l'Entomologiste de Kiel, sur un exemplaire du museum de Schultz, dont les élytres, selon toute apparence, se trouveraient accidentellement obscurcies. Fabricius dit qu'elle est noire, moins le disque des élytres qui est rouge et marqué d'un point noir sur chaque étui. Ou, suivant Schneider, qui paraît avoir visité la collection de Schultz, l'exemplaire typique laisserait compter neuf points noirs sur chaque élytre dont la base et le bord externe sont obscurs."

On referring to Schneider (1792) *Neu. Mag.* II. p. 143, we find:

"h. *Cocc. limbata*, Fabr., aus der Schultzen Sammlung. Sie ist der vorhergehende [=g. *Cocc. 9-punctata*, Schrank = *H. variegata*, Goez.] ganz ähnlich nur durch die schwarzebraune Farbe, womit der Grund und Ausserrand der Decken in betrachtliche Breite angeflogen, etwas verstellt; doch lassen die neun grosser schwarzen Punkte leicht ausfundig machen."

Weise (1879) in his B-T. refers to a specimen in the Berlin Museum:—

"m. Flgd. mit breiten, scharf begrenzten, schwarzen Saume, der mehr als  $\frac{1}{3}$  der Breite einnimmt und P. 5. (1 Stück dieser schönen Var. auf dem Berliner Museum) . . . v. *limbata*, Fabr."

In his 1885 edition Weise uses the same phraseology with the exception of "Seitensaume" for "Saume" and, what will appear significant, he omits any reference to the specimen in the Berlin Museum.

I wrote during 1922 to Professor Kölbe of the Berlin Museum and asked him to look up the specimen referred to by Weise in 1879 and send me a diagram of same. This he very kindly did, but his diagram, while agreeing in other respects with Fabricius' description, and that of later writers, discloses the presence of two spots, viz., 5 and 6.

In this latter respect, the specimen now at the Berlin Museum does not tally with Fabricius' description, and, while it is difficult to say with any certainty which of the two spots, 5 or 6, he intended by the phrase, "puncto atro magno," yet in view of the fact that normally spot 5 is the large spot on this series, coupled with Weise's distinct reference to spot 5—and he appears to have seen such a specimen at some time—I think we may accept spot 5 on the ab. *limbata*, Fabr.

I have therefore named the specimen now at the Berlin Museum ab. *bilimbata*, to distinguish it from ab. *limbata*, Fabr.

FORMULA: 5, 6,  $\frac{1}{2}$  and a black marginal border covering about  $\frac{1}{3}$  of width of elytra, from margin to suture, tapering towards apex, which is red.

5. ab. **hepatizon**, n.ab.

There is a very curiously marked specimen in the general collection at the South Kensington Museum labelled, "India. Adon. Mulsant var." in which all the spots are confluent to an abnormal degree, including the upper spots with the lower.

The markings include a series of three confluences all connected inter se, viz.: (i)  $\frac{1}{2} + 3 + 2$ , then (ii)  $1 + 4$ , crossing (i) at right angles; and (iii)  $4 + 5 + 6$ , which is a liver-shaped blotch containing the red spot found also in ab. *reichii*, mihi (Supra. 2), confluent with (ii).

Whether the additional spot mentioned by Mulsant, *Spec. des Col. Trim. Sec.*, pt. I, 38, 1 (1851), and *Mem. Ac. Imp. Lyons*, xv., 27, 1 (1866), as occurring in his var. *doubledayi* immediately below spot 1 is present in this aberration I cannot say.

The thorax has one of the normal forms of this species, viz., two whitish spots and slight medial depression at apex.

Type in S.K. Museum.

FORMULA:  $\frac{1}{2} + 3 + 2$  crossing at right angles confluence  $1 + 4 + 5 + 6$ , of which  $4 + 5 + 6$  forms a large liver-shaped blotch, with a red spot in centre.

6. ab. **ellisi**, n.ab.

This aberration differs from ab. *harwoodi*, mihi, in having spot 4 joined to the confluence of  $1 + 5$ , which is the distinguishing feature of ab. *harwoodi*. Spot 1 is larger and the confluence bolder, the other spots present being 6 and  $\frac{1}{2}$ .

I found this aberration in the collection of Mr. H. Willoughby Ellis, F.Z.S., F.E.S., who kindly placed his series of this species at my disposal, and after whom I have the honour of naming it.

Mr. Willoughby Ellis informs me this aberration was taken by Dr. Tait at Swanage in June, 1900.

The type is in the collection of Mr. Willoughby Ellis.

FORMULA:  $1 + 5 + 4, 6, \frac{1}{2}$ .

7. Correction for locality of ab. *bearii*, Leman [*Ent. Rec.*, xxxiv., No. 6. p. 102. 8. (1922)].

The locality for this aberration should have been given as "New Brighton, Cheshire, and not Southport."

8. Correction of British Record of ab. *alacris*, Ws. [*Ent. Rec.*, xxxv., No. 1. p. 11. 2. (1923)].

Closer examination proves this specimen to be ab. *obvèsépunctata*, Schrank, and this record should therefore be expunged. I much regret this error.

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**A Summer Holiday at Nyons, Drome, and La Sainte Baume, Var, in July, 1922.**

By LIEUT. E. B. ASHBY, F.E.S., and memb. Soc. ent. de France.

When Mr. F. T. Gilliat kindly asked me last spring to join him and his brother; the Rev. S. W. E. Gilliat, in a butterfly hunt in

Southern France, I suggested to him that we should retraverse some of the ground collected over by the late Mr. Rowland-Brown and Mr. Warren and described in the *Entomologist* of past years. We agreed that it would be worth while to do this and we accordingly arrived at Nyons on July 6th, *viâ* Paris, Valence and Pierrelatte. We stayed at the Hotel Colombet at Nyons, which is satisfactory for a short stay of a few days and reasonable, but we must warn any entomologist who may follow us to keep carefully all his captures and collecting material, etc.; under lock and key during his stay, as the spirit of curiosity (and consequent loss or damage) is developed to an extraordinary degree at this hotel.

We found insects in the Nyons district comparatively scarce, probably owing to the great drought of 1921, but during the four days we spent there we captured between us the following (omitting those very commonly met with anywhere): *Papilio machaon*, *P. podalirius*, *P. alexanor*, *Gonepteryx cleopatra*, *Pieris manni* (abundant), *Melitæa dia*, *M. phoebe*, *M. didyma*, *Melanargia galathea* var. *procida*, *Klugia spini*, *Nordmannia ilicis*, *Lycaena arion*, *Agriades thersites*, *Hirsutina admetus* var. *ripartii*, *Polyommatus escheri* females only, *Satyrus fidia* (one taken by Mr. F. T. Gilliat), *Satyrus circe*, *S. hermione*, *Coenonympha arcania*, *C. dorus*, *Epinephele jurtina* var. *hispulla*, *E. pasiphæä*, and *Polygonia egea*. I also took the Paraneuroptera (Odonata) *Cordulegasta annulatus* (very common), *Sympetrum meridionale*, *Lindenia forcipatus* and *Aeschna mixta* (very abundant); the Hymenoptera *Mylabris quadripunctata*, *Scolia hirta*, *Bombus ligusticus*, *Pimpla instigator*, *Haliectus quadristrigatus*, *Anthophora quadrifasciata*; the Dipteron *Selidopogon diademe*, besides the Moths *Zygaena lonicerae*, *Z. filipendulae*, *Z. ephialtes* ab. *athamanthae* and *Acontia lucida*. *P. alexanor* was anything but common and after many hours hard work I only succeeded in getting two, both fine female specimens. The males were apparently quite over at this date.

On July 8th we took the autobus to Rosans in the Hautes-Alpes, a distance of 39 odd miles, arriving there about 9 a.m. We soon found to our regret that the main object of our journey, *Melanargia japygia*, race *cleanthe*, the rarest of French *Melanargias*, was quite over this year, judging by the very few chipped and worn specimens met with. However, Mr. Gilliat took a nice series of *Polyommatus admetus* race *ripartii*, and amongst a number of very fresh *M. galathea*, race *procida*, which I secured, there was an extremely dark melanic form, which is very striking in appearance. At this place we took fresh *Satyrus cordula*, *Pontia daphidice*, *Anthocharis crameri* var. *ausonia*, and *Scolitantides baton*, with the Cicada, *C. fraxina*, which was both noisy and abundant, flying from tree to tree on the lower sides of the slopes. The collecting ground at Rosans is very extensive, rising for some considerable distance behind the little hotel of the village. We can recommend this hotel for a few days stay; it is clean, the food is well served and tariff satisfactory. We returned to Nyons in the evening after a very interesting day. During our last day at Nyons, in a fruitless effort to get more specimens of *P. alexanor*, of which we saw a few, but could not get near among the scrub on the steep hillsides, I got a female *Heodes doris* and two *H. alciphron* var. *gordius* females. Nyons was essentially the Land of Olive Trees and the little green berries will later on produce the full-grown fruit in December.

We left Nyons on July 10th, and as we had two hours to wait at Pierrelatte, we tried to collect along the banks of the P.L.M. main line in a tempestuous wind. In a few sheltered hollows we found *Thymelicus acteon* abundant, a specimen of *Satyryrus briseis*, *Agriades thersites* and *Acrionicta rumicis*, with some commoner insects.

We stayed the night of July 10th at Aubagne, beyond Marseilles, and leaving early the next morning we reached the hotellerie at La Sainte Baume by autobus a little before midday. Most of the time we collected along the wooded escarpment at the back of the hotellerie; and also along the broad and hot expanse of the Plan d'Aupe, a plateau of considerable length running roughly east and west from the hotellerie, which faces north; also about the top portion of the road leading from Ste. Baume to Nans, and on the zigzag path to Nans, which leads down off from the main road shortly after it begins to descend. We also found it well worth while to work the ground immediately in front of the hotellerie as far as and to the right of a large cross, standing high on some boulders to the north. It is prudent to keep well to the path here to avoid the dangerous boulders and the crevices which for the most part are difficult or impossible to cross.

One day I walked to the Col de Bretagne, but met with nothing interesting after leaving the Plan d'Aupe, which swarmed with many species of Orthoptera, though the view of the hills of Provence and the sea beyond was very fine. Another day I walked up to the grotto of St. Mary Magdalene above the forest south of the hotellerie, but a camera is more useful than a net up there, and the views ought not to be missed.

When we first arrived at Ste. Baume we found *Polyommatus dolus* in good condition, but not very common. It was distributed all round the borders of the forest land, and we afterwards found it much more abundant in the woody "oases" stretching out from the main forest on to the Plan d'Aupe to the west of the hotellerie. *S. actaea* we found just coming out on rocky ground a little north of the hotellerie, to the right of the above-mentioned cross. Both sexes were out. *Laeosopis roboris* was much too worn, although we took a round dozen between us. It occurred mostly on the bushes and scrub on both sides of the Nans road, just where it begins to descend, and also along the ridge due west from this towards the direction of the above-mentioned cross.

Of *Brenthis hecate* a few fair specimens were obtained after careful selection on the outskirts of woods and on thistle heads among fir plantations, on the Plan d'Aupe. *S. briseis* commenced to emerge about July 14th, and soon became exceedingly abundant in both sexes, the first female emerging a few days after the 14th. Many of the females were the aberration *pirata*. The second brood of *Limenitis camilla* was emerging at both Nans and Ste. Baume about July 16th.

On the 18th the Rev. S. Gilliat and I descended to Nans by the zigzag footpath which is considerably shorter than the main road and we had a famous lunch at the Grand Hotel de Lorge at Nans-les-Pins to give the little place its full name. We found the proprietor very polite and he remembered the names of quite a number of British naturalists. On arriving at Ste. Baume I had been given the rooms which had just been vacated by Dr. Rosa, who had gone down to Nans, from where he wrote me, but unfortunately I did not see him

again at Nans as he had gone before I visited the village. On this visit to Nans we took the only *Dryas pandora* I have seen in Provence this year, a female of *B. hecate*, a nice series of a small race of *Epinephele ida*, which appears to reach its highest limit here a little way below the Hotel de Lorge, where I found it along a good path behind the hotel leading towards the village, *Erynnis attheae* one, a very dark *Rumiccia phlaeas*, and a specimen each of *Hesperia sao* and *H. carthami*. We also took a small number of *Zygaena occitanica*, freshly emerged, and a couple of *Z. fausta*. Here as at Ste. Baume butterflies were comparatively scarce compared with the usual abundance in July in a normal year.

The numerous carp in the Hotel ponds at Nans were stated to be 37 years old; they are well fed by the numerous summer visitors to the Hotel. Specimens of *Libellula depressa* in their full blue plumage were flying over these pools and could easily be caught when settled, as they frequently did. *S. alcyone* was flying all along the zigzag path between Nans and Ste. Baume in very fair condition. One day in the forest at Ste. Baume we met M. François Bernard of Dunkirk, a coleopterist and member of the Ent. Soc. of France, who gave me a specimen of *Ledra aurita* (Hem.) he had just taken.

Besides the insects above mentioned we found between us in the Ste. Baume district (omitting the commoner species) the following Rhopalocera:—*P. podalirius*, *P. machaon*, *Pieris manni*, *Colias croceus*, *Gonepteryx cleopatra* (abundant), *Nordmannia ilicis*, *Strymon w-album*, *Bithys quercus* (abundant, very large specimens), *Eugonia polychloros*, *Polygonia c-album*, *Euvanessa antiopa*, *Melitaea athalia*, *M. cinxia*, *M. didyma*, *M. dia*, *M. parthenie*, *M. phoebe*, *Dryas paphia*, with several very fine var. *valesina*, *Argynnis cydippe*, *Celastrina argiolus* (large), *Scolitantides baton*, *Polyommatus escheri*, *Agriades thetis*, *A. coridon*, *A. thersites* (fairly plentiful especially in fir copses just outside the edge of the forest), *S. alcyone*, *S. circe*, *S. briseis*, *Epinephele lycæon* and var. *lupinus*, a fine form of *S. semele*, *Melanargia galathea* tending towards var. *procida*, *M. arge*, *M. syllius* (one worn), *Coenonympha dorus*, *C. pamphilus* var. *lyllus*, *Rumiccia phlaeas* var. *eleus*, *Thymelicus acteon*, *Pyrgus proto*, *Hesperia onopordi* male and female, etc.

Heterocera:—*Smerinthus quercus*, *Ino globulariae*, *Sesia asiliformis*, *Zygaena trifolii*, *Z. transalpina* ab. *astragali*, *Z. fausta*, *Lithosia complana*, *Catocala conversa*, *C. nymphagoga*, *Polyphaenis sericata*, *Cilix glaucata*, *Pseudopterna pruinata*, *Boarmia lichenaria*, and *Hylophila quercana*.

Coleoptera:—*Strangalia armata*, *Ergates faber*, *Crioccephalus rusticus*, *Leptura fulva*, *Trichodes alvearius*, *Mylabris quadripunctata*, *M. variabilis*, *M. 12-punctata*, *Clytus floralis*, *Leptura hastata*, *Cetonia aurata*, *Cryptoccephalus sexmaculatus*, *Lampra festiva*, *Chlorophorus trifasciatus* and *Scarabaeus laticollis*.

Paraneuroptera:—*Aeschna mixta*, *A. cyanea*, *Calopteryx virgo*, *C. haemorrhoidalis* (the two last caught at Ste. Maxime and given me), and *Myrmeleon europæus*.

Hymenoptera.—*Ammophila sabulosa*, *Eumenes unguiculus* (a wasp, erroneously called a bee, *Ent. Rec.*, vol. xxxiv., p. 161), *Polistes gallica*, *Bombus pratorum*, *Vespa germanica*, *Discolia quadripunctata*, *Bembex sinuata*, *Philanthus triangulum*, *Halictus sexvinctus*, the Braconid *Glyptomorpha pectoralis*, and one of the rare *Cryptochilus octomaculatus*, *Anthophora gallica* (dubia).

Orthoptera.—*Aedipoda miniata*, *Caloptenus italicus* and nymph, *Oedalus nigrofasciatus* (*flavus*), *Decticus albifrons*, *Bacillus gallicus*, *Stenobothrus grammicus*, *Barbitistes fischeri*, and *Leptophyes punctatissima*.

Rhynchota.—*Ledra aurita*, *Cicada fraxina*, *Pentatoma rufipes*, *Harpactor iracundus*, and *Carpocoris purpureipennis*.

Diptera.—*Volucella inanis*, *V. zonaria*, *Sphaerophoria nigricoxa*, *Tabanus bovinus*, *Anthrax fenestrata*, *Fallenia fasciata*, *Stenopogon sabaudus*, and *Selidopogon diademe*.

I was glad to take a good long series of *Sesia asiliformis*, all on one large blackberry bush still in blossom along the Nans road.

The greatest disadvantage we found was the continuous very gusty wind which blew most days in full force across the Plan d'Aupe. Barring two very slight showers we had no rain at Ste. Baume. We found M. Pedone at the hotellerie most obliging and he is very anxious to increase the numbers of his British clientèle.

It was not until July 20th that I succeeded in finding *Hirsutina dolus* in any number. Previously to that date we had found it very sparsely distributed in many places around the hotellerie. But on this date after déjeuner, towards 5 p.m., on the Plan d'Aupe, I discovered both sexes in considerable numbers at rest on long grass stalks in a sheltered position under one or two isolated trees, but still getting the rays of the afternoon sun. With them were a few *Aagriades coridon* and *C. pamphilus* var. *lyllus*, with one or two *Pyrgus proto*. These trees were the extension of a copse that juts out into the plain about two miles due west from the hotellerie on the left. It would seem from this that *H. dolus* is decidedly gregarious in its habits and so different from *A. coridon*, which rests scattered all over the plain on lavender, etc. Evidently this is the time of day to get *H. dolus* in any number at this locality. The species appears considerably less active than *A. coridon*.

On July 22nd the Rev. S. W. E. Gilliat gave me a specimen of the "stick insect" he had taken, most probably coming from a fir-tree near by. Unfortunately we did not see any more and I was unable to observe its habits in the open. The species is *Bacillus gallicus*; it is herbivorous, sluggish and harmless, of a curious stick-like build, always apterous in Europe. Only one other species occurs in S. Europe and N. Africa, viz., *B. rossii*. They may be found all the year round in very hot places in the extreme South of Europe. In France *B. rossii* has been taken at Hyères, Cannes, Ste. Maxime and Draguignan, but the male is excessively rare.

Our very pleasant visit to Ste. Baume was enlivened by the great numbers of pilgrims to keep St. Mary Magdalen's day and who also on Saturdays and Sundays thronged the hotellerie. The legend of the grotto above the hotellerie has a great hold on the Provençals and one of the most beautiful sights I shall ever remember was that of the grotto chapel at midnight, lit up for mass, the rays of light streaming down over the dark and silent forest below, and the deep tones of the clear church bell as, in the stillness of night, it pealed forth its call to the assembled pilgrims to worship.

We left Ste. Baume on July 24th, accomplishing the hazardous descent in safety, and went direct to Marseilles by way of Auriol, after a very happy and successful trip in Provence.

On the way home, however, I spent a few days at Lardy, in the Department of the Seine-et-Oise, easily reached from Paris, Gare Austerlitz, in little more than an hour. There is a fine expanse of collecting ground here, on the uplands rising from just north of the railway immediately from the station. *Colias hyale* was in great abundance, *P. machaon* some and *Lycaena arion*; abundance of "burnets" *Zygaena fausta*, *Z. carniolica*, *Z. filipendulae*, *Z. ephialtes* ab. *athamanthae*; and *Orneodes hexadactyla*. Among the Hymenoptera were *Philanthus triangulum*, *Athalia glabricollis*, *Bombus agrorum* and *Anthophora dispar*. The Neuroptera were *Ascalaphus longicornis* female, and *Chrysopa vulgaris*. The Orthoptera were *Oedalus nigrofasciata*, the larva of a species of *Ephippigera* and *Oedipoda miniata*.

In conclusion, I must express my best thanks to Messrs. Blair, China, Edwards, Tams, and Dr. Uvarov of the Natural History Museum, and to the Rev. F. D. Morice and Mons. J. M. R. Surcouf, of Paris, who have all invariably given me the kindest assistance in helping me to name some of the more unfamiliar species.

## NOTES ON COLLECTING, etc.

WARWICKSHIRE RECORDS OF ICHNEUMONIDAE (Continued).—CRYPTINAE.—*Crotocryptus parvulus*, Gr.—Coombe, 9.v.20. *Cubocephalus brevicornis*, Tasch.—Brandon, 2.xi.19. *C. oriventris*, Gr.—Stoke, 17.vii.20, rare. *Microcryptus abominator*, Gr.—Stoke, 10.vi.18; 12.viii.19; 10.vii.21; Canley, 11.v.21. *M. leucostictus*, Gr.—Stoke\*, 22.v.20. *Glyphicnemis profligator*, Fab.—Generally distributed. *G. brevis*, Gr.—Wyken, 4.vi.17. *G. erythrogaster*, Gr.—Stoke, 7.vi.21. *Phygadeuon variabilis*, Gr.—Coombe, 29.v.21. *P. exiguus*, Gr.—Stoke, viii.16, ♀. *P. fumator*, Gr.—Stoke, 1.vi.19; 21.vi.19; Brandon, 19.x.19. *Panargyrops tenuis*, Gr.—Stoke, 10.vi.17. *Hemiteles necator*, Gr.—Stoke, 10.v.21. *H. bicolorinus*, Gr.—Stoke, 1.vi.19. *H. areator*, Pz.—Common and generally distributed. *H. cingulator*, Gr.—Stoke, 22.v.21. *H. castaneus*, Tasch.—Stoke, 15.vii.21. *H. similis*, Gm.—Stoke, 16.xi.19; 24.viii.19; 9.v.20. *H. aestivalis*, Gr.—Stoke, 28.viii.20. *H. validicornis*, Thms.—Stoke\*, 1919. *H. politus*, Bdg.—Stoke, viii.1916, ♀. *Pezomachus instabilis*, Fst.—Ryton\*, 1919. *P. intermedius*, Fst.—Stoke\*, 1919. *Stilpnus gagates*, Gr.—Stoke, 10.vi.19; 26.v.20. *S. blandus*, Gr.—Stoke, 16.vi.17; 1918; 8.vi.19; rare. *Atractodes tenebricosus*, Gr.—Stoke, 17.vii.20; 17.x.20; 1.v.21. *A. bicolor*, Gr.—Brandon, 24.viii.19; Coleshill Bog, 29.ix.19. *A. gilvipes*, Hlgr.—Stoke, 22.v.19; 21.vi.19. *Exolytus laevigatus*, Gr.—Bubbenhall, 10.vi.17. *Pycnocryptus peregrinator*, L.—Stoke, 1916; Brandon, 20.v.17; Wyken, 4.vi.17; Bubbenhall, 10.vi.17. *Spilocryptus abbreviator*, Fab.—Church Lawford, 27.vii.19. *Gonicryptus titillator*, L.—Coombe, 15.viii.20. *Cryptus tarsoleucus*, Schr.—Coventry, 1915, ♀. *C. viduatorius*, Fab.—Brinklow, 24.v.19. *C. obscurus*, Gr.—Generally distributed. *Habrocryptus porrectorius*, Fab.—Coombe, 9.v.20; Stoke, 8.x.21.

PIMPLINAE.—*Xylonomus securicornis*, Hlgr.—Ryton, 6.vi.20; Rare, 4th specimen known, 3rd Gt. Britain. *Ephialtes carbonarius*; Chr.—Waverley Wood, 22.ix.18, H. G. Wagstaff; Bubbenhall, ♀ ♀, 15.viii.20, F. Pepper. *Perithous divinator*, Rossi.—Stoke, viii.16, ♀. *Pimpla ruficollis*, Gr.—Waverley Wood, 24.viii.19, H. G. Wagstaff;

Bubbenhall, 7.ix.19, H. Cooke. *P. brevicornis*, Gr.—Stoke, viii.16; 10.ix.17; Bubbenhall, 16.ix.19; Brandon, 2.xi.19. *P. detrita*, Hlgr.—Brinklow, 2.viii.20. *P. instigator*, Fab.—Common and generally distributed. *P. turionellae*, L.—Common and generally distributed. *P. maculator*, Fab.—Common and generally distributed. *P. rufata*, Gm.—Common and generally distributed. *Clistopyga incitator*, Fab.—Stoke, 26.v.19; 20.viii.19; Bubbenhall, 17.viii.19. *Glypta parvicandata*, Bdg.—Coleshill Bog, 27.ix.19, rare. *G. scalaris*, Gr.—Princethorpe, 26.vii.19. *G. bifoveolata*, Gr.—Stoke, 20.v.19; Binton, 1.viii.20. *G. flavolineata*.—Bubbenhall, 27.vii.18; 29.vi.19; Kenilworth, 8.viii.20. *Cryptopimpla caligata*, Gr.—Stockton, 28.viii.20; rare. *Lissonota bellator*, Gr.—Stoke, 16.vii.21. *L. cylindrator*, Vill.—Stoke, 17.vii.20; Brinklow, 2.vii.1920; Bubbenhall, 30.vii.21. *L. sulphurifera*, Gr.—Generally distributed. *Meniscus catenator*, Pz.—Coombe, 30.vi.18. *Alloplasta murina*, Gr.—Generally distributed. *Phytodiaetus obscurus*, Desv.—Coombe, 9.v.20. *Lampronota melancholica*, Gr.—Ryton, 6.vi.20. *Collyria calcitrator*, Gr.—Coventry, 1915. *Banchus pictus*, Fab.—Generally distributed. *Exetastes cinctipes*, Retz.—Generally distributed. *E. laevigator*, Vill.—Bubbenhall, 10.vi.17. (To be continued.)—J. W. Saunt, 53, Enfield Road, Stoke, Coventry.

## CURRENT NOTES AND SHORT NOTICES.

We congratulate Dr. G. A. K. Marshall, C.M.G., F.Z.S., F.E.S., on his election to a fellowship in the Royal Society. There are but too few representatives of our Science of Entomology in the Society, and even that small number has been lessened of late by the deaths of Dr. T. A. Chapman and Mr. Elwes. May Dr. Marshall enjoy the honour for many years to come.

## SOCIETIES.

### THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

November 23rd.—ANNUAL EXHIBITION.—Messrs. A. de B. Goodman and O. R. Goodman exhibited 63 species (out of 113) taken by them in the French Pyrenees (Orient.) in July, 1922, including *Papilio podalirius* race *feisthamelii*, *Pieris manni*, *Laeosopsis roboris*, *Apatura ilia* var. *clytie*, *Argynnis cydippe* ab. *cleodora*, and the form *chlorodippe* not previously recorded from French soil, *Parnassius apollo* ab. *brittingeri*, *Latorina orbitulus* race *oberthüri*, *A. pyrenaica*, *Erebia epiphron* race *pyrenaica*, *E. manto* race *constans*, *E. gorgone*, *E. lefebvrei*, etc.

Lord Rothschild exhibited a series of over 500 British *Arctia caja*, including many aberrations, together with larvae, pupae, and parasites. He also exhibited for comparison a series of continental European typical specimens and aberrations, and the various Asiatic and American geographical races of *A. caja*. He drew special attention to the Armenian and S. Caucasian race *wiskotti*, Stögr., as being dimorphic, the ♂ having white and the ♀ rose-coloured hindwings. The Japanese race was distinguished by its large size and heavy marking, while most of the American races have red tegulae (patagia).

Mr. W. G. Sheldon, a series of about 700 *Sarothrips revayana*, with all the named forms except ab. *sagittata*.

Mr. E. E. Green, a small collection of miscellaneous Arthropods

from Ceylon, including a large hunting spider (*Paecilotheria*), a "Cobra" Mantis, a "lanternfly," the "Caricature bug" *Cetacanthus*, etc., and bred series of *Pyrameis cardui* and *Euvanessa antiopa*, the latter from Gavarnie.

Mr. H. A. Leeds, many aberrations of British Rhopalocera captured in 1922, including *Melanargia galathea* with golden-tawny borders of all wings, and forms comparable to ab. *procida*, ab. *caeca* of *Aphantopus hyperantus*, ab. *ptorsas* of *Strymon pruni*, extra spotted *Epinephele jurtina*, *Argynnis aglaia* and *Coenonympha pamphilus* with greatly increased area of wings melanic, numerous named forms of *Plebeius aegon*, many combination aberrations of *Agriades coridon*, named from Tutt's *British Lepidoptera*, and many others.

Rev. G. Wheeler, the type specimens of *Loveia subalpina* var. *brunnea*, *Nomiades semiargus* ab. *striata*, *Albulina pheretes* ab. *caeruleopunctata*, etc., very fine striated forms of *Glaucopsyche cyllarus*, *Polygonmatius icarus*, *Heodes virgaureae* var. *zermattensis*, and *Loveia alciphron* var. *gordius*, also fine series of *Parnassius apollo* ab. *rufa*, *Apatura iris* ab. *iole*, *A. ilia* var. *clytie*, ab. *eos*, etc., with many other species showing obsolescence or excess of spotting.

Miss L. Cheesman, a Japanese Long-horned Grasshopper, *Diestrammena marmorata*, a pest in greenhouses with orchids.

Dr. G. S. Robertson, 2nd, 3rd, and 4th generations of *Catocala fraxini* from Horsham; the 4th gen. specimen was very pale, the 2nd gen. specimen very dark.

Mr. H. B. Williams, the series of *Euchloë cardamines* with its named forms, described in *Trans. Lond. N. H. Sy.*, 1915, with many minor aberrations.

Mr. R. Adkin, his series of *Diacrisia mendica* with all the named forms, including the new race *venosa* and the new mongrel race *mistura*, with a series of *Herse convolvuli*, taken in his garden at Eastbourne.

Mr. L. T. Ford, a short series of *Peronea cristana* from the Isle of Wight, including an ab. *purdeyana*, a form hitherto only taken at Folkestone.

Mr. Hy. J. Turner, two old entomological works, Moufet's *Insectorum sive Minimorum Animalium Theatrum*, London, 1634, and Ulysses Aldrovandus, *De Animalibus Insectis libri septem*, (1602) 1638.

Mr. A. A. W. Buckstone, a striated (underside) *Brenthis euphrosyne*, Kent, a dull brown *Vanessa io*, bred Lancashire, a melanic *Tephrosia consonaria*, Maidstone, extreme light and dark-banded *Urocallis elingvaria*, Wimbledon, etc.

Prof. Bateson, forms of the leaf in *Primula sinensis*, represented as resulting from the combinations of three pairs of factors, any of which may be present or absent.

Mr. A. W. Mera, a series of *Psilura monacha*, bred from 1918 parents in successive years, the tendency to melanism being fully maintained to the last.

On behalf of Mr. Copeland, Mr. Mera exhibited some fine examples of *Catocala nupta*, with smoky hindwings, taken at Loughton in September, 1918.

Mr. W. J. Kaye, a pair of the hybrid Sphingid *luciani*, Denso, a cross between *Pergesa porcellus* ♀ and *P. elpenor* ♂.

Mr. W. Brocklehurst, a gynandromorph of *Dryas paphia*, New Forest, 1922, and the rare *Notodonta tritophus*, Bedford, light, May, 1907.

Mr. W. G. Nash, a gynandromorph of *D. paphia* and var. *valesina*, New Forest, 1922, a nearly black ♂ of *A. coridon* var. *plumbescens*, Royston, and an intersex of the same species without androconia, etc.

Rev. J. E. Tarbat, *Xylophasia monoglypha* from six localities, including an intensely black specimen from Mucking and a very pale form from Freshwater; also *Dysstroma truncata* from the latter place, one dark-banded, another with much grey suffusion.

Mr. L. W. Newman, his 1922 captures of *Agriades thetis*, with extreme aberration in colour and marking, with 1921 series to show the contrast between the hot and cold season coloration, compared series of *Melitaea aurinia* from many localities, living pupa and imagines of *Colias croceus* from September laid ova, and many other notable aberrations.

Mr. R. T. Bowman, varied series of *Polia chi* and var. *olivacea*, and examples of *Numeria pulveraria*, showing aberrant coloration.

Dr. E. A. Cockayne, on behalf of Mr. Arthur Dicksee, (1) Homoeosis in *Papilio horishanus*, Formosa; (2) an aberration of ♂ *P. taiwanus* with an angulated instead of rounded hindwing, (3) a series of *Agrias amydon* showing stages in the development of a blue mark on the hindwing.

Mr. L. F. Hammond, an *Epinephele jurtina* of a pale silvery grey ab. *brigitta* and an *Aricia medon* with the white coloration replaced by dull grey and lead colour.

Col. R. H. Rattray, aberrations of British *Lycaenidae*, *Agriades thetis* ♂ with light grey patches, ♂ with dark leaden coloured bar across wings, *Plebeius aegon* with similar patches, an intersex with androconia, *Adopaea flava* with glistening white patches, *Zygaena filipendulae* with confluent spots on right forewing, and *Hipoerita jacobaeae* with red costal streak united with the two outer marginal red spots, and *Cupido minimus* with incipient striation.

Mr. B. H. Crabtree, aberrations of *Argynnis aglaia* black markings replaced by silver, ab. *albomaculata*, and another with forewings black shot with dark green and only a few fulvous spots, a third with extensive coalition of silver on the underside, and upperside nearly spotless, with series of aberrations of *A. thetis* and *A. coridon*.

Mr. B. W. Adkin, a small suffused *A. aglaia*, *A. cydippe* with enlarged markings, *Vanessa io* specimens with very variable borders to forewings.

Mr. C. H. Williams, aberrations of *A. grossulariata* and *A. coridon*.

Mr. G. H. Cornish, on behalf of Mr. Juby, a *Rumiccia phlaeas* with the red marginal band represented by red dots, ab. *radiata*.

Mr. A. E. Tonge, *R. phlaeas* ab. *schmidtii*, bleached forms of *Epinephele jurtina*, striated and obsolete forms of *A. coridon*, *A. thetis*, etc.

Mr. D. Pearson, *Polyommatus icarus* from Notts, 1922, a fine gynandromorph, left side ♂; right side ♀, various blue ♀s, some with well-marked lunules, and a large number of varied forms of *Rhopalocera* taken in the Eastern Pyrenees, and a drawer of *Melitaea didyma*, referring especially to the very remarkably dark variegated Gavarnie females.

Mr. W. F. H. Rosenberg, rare Lepidoptera from S. America, *Papilio euterpinus*, *Pereute beryllina*, the Saturniidae, *Copiopteryx sonthonnaxi*, *C. darceto*, *Loxoloma serpentina*, the first of which had strong sexual dimorphism in the form of the hindwings, etc.

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*Desiderata*.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether, "Thelma," 4, Willow Bridge Road, London, N. 1.*

*Duplicates*.—*Aglais*, *Adippe*, \**Io*, *T. quercus*, *Coridon* vars., \**Fuliginosa* (Reading), \**B. quercus* ♀, *Tiliæ*, *Menthastri*, \**Linariata*, *Aurantiaris*, *Leucophæaria* vars. *Paniscus*. *Desiderata*.—Pupæ of *Dictæoides*; Imagines of typhon, palpina, camelina (dark), *Curtula*, *Pyra*, and numerous others; Ova of *Hispidaria*.—*Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.*

*Duplicates*.—*Sybilla*, *Paphia*, *Io* (2), *Selene*, *Lucina* (2), *Ocellatus*, *Illustraria* (autumn) *Nastata*, *Roboraria* ♂, *Prunaria* (4) ♂, *Tipuliformis*. *Desiderata*.—*Castreusis* ♂, *Cucullina*, *Cribrum*, *Cinerea*, *Ravida*, *Ashworthii*, *Notata*, *Obfuscaria*, *Smaragdaria* and others, also vars. and local forms.—*Harold E. Winsor, Kent House, Cranleigh.*

*Duplicates*.—*Cinxia*, *Bellargus*, *Coridon*, *H. Comma*, *Lineola*, *Galathea*, *Moneta*, *Nupta*, and many others. *Desiderata*.—*Blandina*, *Irish Icarus*, *Carmelita*, *Cuculla*, *Gonostigma*, *Ashworthii*, *Templi*, *Australis*, *Undulata*, *Smaragdaria*, *Testacea*.—*W. Gifford Nash, Clavering House, Bedford.*

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## MEETINGS OF SOCIETIES.

**Entomological Society of London**.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. March 21st; April 4th.

**The South London Entomological and Natural History Society**, *Hibernia* Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. —*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.

**The London Natural History Society** (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

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## Notes on the Psychides.

By the Rev. C. R. N. BURROWS, F.E.S.

(Continued from page 43.)

*Luffia lapidella*.—Claimed by Tutt as a denizen of the British Islands, has up to the present evaded my search. Apparently widely distributed on the Continent, it reaches the Channel Islands, where, from the number of larvae sent to me by the late Rev. F. E. Lowe of Guernsey, it would appear to swarm upon his Vicarage garden wall. The male has never been found in Great Britain, but it is included in Tutt's work on the strength of the supposed capture of the female on the South Coast. I have not myself received any females from the south of England, which differ in the slightest detail from the ubiquitous *L. ferchaultella*. The tarsal formula for the female *lapidella* would appear to be 4-4-4, that of *ferchaultella* every possible combination of 4 and 3, as is pointed out by Tutt, even to 2-2-2, for the joints are fused without limit.

I bred a male of *lapidella* from Guernsey in 1917, which became violently excited when introduced to a female of *L. ferchaultella*. Copulation appeared to ensue, but instead of only lasting a few minutes, as is the usual case with *Psychides*, this continued for half-an-hour. The female did not lay a single egg. As the eggs in this genus are laid into the empty pupa-shell, which remains within the larval case, I examined this shell and found it to be quite empty.

Never before have I known one of these females die without laying. Amongst the *L. lapidella* from Guernsey I found at least one female of *L. ferchaultella*. Possibly the larva had wandered, or been collected from, a neighbouring post or tree.

*L. ferchaultella*, Steph. (= *pomonae*, Stainton).—The fences, posts, and trees, in this district are generally crowded with cases of this male-less, and therefore parthenogenetic species, in separate colonies rather than continuously. I have watched the growth of these colonies. A new length of "Yarra wood" railway fence  $\frac{1}{4}$  mile long constructed some 15-20 years ago, showed no signs, at first, of this species. Having found a *Solenobia* thereon, confined to about twenty yards at one extremity, I have watched the fence rather narrowly. At first *ferchaultella* was absent. I chose the unoccupied pales at the further extremity, as a suitable situation on which to plant out a number of cases of *Solenobia lichenella* from Wellington, Berks, sent by Mr. Hamm. These were evidently mixed with the present species, for *lichenella* disappeared, but *ferchaultella* remained, a single colony at first, and at the present patches occur along the whole length.

This is the species which created a great deal of interest in the Bristol district some years ago, about which Harding wrote in the *E.M.M.*, vol. vi., pp. 91-93 (1869), and vol. xii., p. 208 (1876), suggesting that it is the apterous, and parthenogenetic female of *Narycia monilifera*. Mr. Hudd through Mr. G. C. Griffiths of Clifton, handed over to me a card which Harding had arranged to illustrate his theory. This card has two series of larval cases, the first evidently of *N. monilifera*, the second of this species. Below are 5 circles drawn in ink, and lettered, "Apterous females of *S. pomonae*." The females had disappeared\*.

\* Referring to the female *Psychides* it is curious to notice how exceedingly liable they seem to be to the attacks of the *Psocids*, *Acari*, and such like unwelcome

It is certain that Harding did not realise that a winged female *N. monilifera* had laid her eggs among his *ferchaultella*. This has happened several times to me.

Tutt says that the females of *ferchaultella* do not "call" upon emergence, and Chapman separated, under the name of *L. maggiella*, a race whose females do "call." I have repeatedly found females which do "call," and Mr. Metcalfe received from Whittle, who collected them at Wicken, specimens which also "called." The distinction here would appear to be rather forced.

*Masonia crassiorella*.—Another species which is credited with occurring in Great Britain. I can find no British male among Chapman's material, although there may possibly be some amongst the unlabelled specimens named as this species. Nowhere have I found any specimens amongst the material sent to me by friends. Chapman shows that the continental males will pair with females from the South of England. It is possible that what I found to occur between the two *Luffias*, also occurs with this insect. Yet I cannot but regard the species as a most unsatisfactory one. The difference in the position of the base of the anterior tibial spur, from that in *Fumea casta*, seems to me to be a small matter, when all other distinctions only amount to a question of size and colour. If the large number of specimens in my hands be correctly named (tested by the position of the base of the anterior tibial spur) then there is a very great variation in size amongst the imagines.

I have now in my hands a race sent to me by Count E. Turati, of Milan, which appears to be this insect. The imagines† appeared in 1922 before my local *Fumea casta* emerged. I am hoping with the progeny, now half grown, to be able to discover whether *crassiorella* will pair with the *Fumea casta* from Mucking.

I have not been able to learn anything more about *Proutia eppingella*, Tutt, and *Masonia edwardsella*, Tutt, the types of which are in the British Museum, nor of *M. mitfordella*, Chapman, *M. hibernicella*, Chapman, and *Fumea scotica*, Chapman. It may be that the fine distinctions upon which these species were founded, are but extremes where variation is considerable.

The last time I saw F. G. Whittle, he brought me a large *Fumea* from Scotland under the firm conviction that he had taken *F. scotica*. So far as this insect is "large and robust," all was satisfactory, but the tibial formula proved it to be probably only *casta*.

The parthenogenetic powers of the *Psychides* have not forced themselves upon my attention. *L. ferchaultella* is confessedly so, but of that of other species I have not been able to convince myself. In the case of the three *Solenobias* which I find in Mucking, I have no absolute confirmation. With the large species which occurs commonly upon the posts by the river wall, upon gate posts along the roads, and found by Whittle upon posts in different parts of the marshes, I have

---

visitors to the collection. Should such reach a case of *Psychides*, the females, pinned and carded, are the first to suffer, and I rarely find a perfect specimen, with antennae and legs intact under such circumstances.

† It is noteworthy that these imagines upon emergence exhibited a very bright fiery red sheen, which rapidly passed away. The same evanescence of colour appears to be exhibited by *Ptilocephala bicolorella*, Bdv., which is reduced to *P. angustella*, H.S., very shortly after emergence.

found the females which are collected after emergence produce, as a rule, fertile eggs; while those which emerge in captivity, do not. It is the same with the small species which I call *inconspicuella*, and with the third species which I find upon the "Yarra wood" fence. This would appear to prove the existence of the male, yet all my attempts to find that sex have failed. I have never bred a specimen amongst the large number which I have collected in the course of years. I have also failed in my attempts at "assembling," and even in trapping him should he come when I was not present. I contrived a little trap which ought to have revealed his presence. Taking a chip box I placed a fresh female therein, and covered the open box with a piece of muslin, secured by an elastic band. In the centre of the muslin I then made a hole with the point of a pencil, just sufficiently large for his passage. The pencil leaves a slight "turning in" of the muslin round the hole, which I imagined would deter the invading insect from returning the way he came. No vestige of a visitor has ever appeared.

I have netted in my garden *Narycia monilifera*, *Diploma herminata*, *Fumea casta*, *Epichnopteryx pulla*, and *Talaeoporia tubulosa*, but no *Solenobia*.

There is little question but that the *Psychides* exhibit periods of abundance alternated with times of scarcity. At Brentwood during April and May, 1886-7-8, I found innumerable males of *inconspicuella* upon Thorndon Park fence. From the latter year until I left the district in 1890 I found no more imagines or cases. I have paid occasional visits since, and Whittle used to search nearly every year, and was rewarded once by capturing a male. Doubtless had I lived upon the spot I might have experienced another year of abundance. It would appear to be much the same with other species. Norgate found large numbers of larvae of *Pachythelia villosella* in the New Forest, August 21st, 1879. He described his takings as "a band box full" (Tutt, vol. xi. p. 412, wrongly ascribes the record to me). I found upon the river wall at Rainham a swarm of *Epichnopteryx pulla* males, females, and cases. Mr. Hayward of Repton, writes me that on Cannock Chase, in April, 1920, he found large numbers of males of a *Solenobia*, flying and at rest. Specimens of these sent to me, judged by size and colour might probably as well be named *S. nickerlii*, as *S. inconspicuella*. Bankes' success with *B. staintoni* may be another instance.

Contrasted with these experiences of abundance I would mention that for the last two years the commonest species have been rarely met with, even in the spots where they have been previously plentiful. The reason for the variability of these insects, as also with most *Lepidoptera* is probably to be ascribed to the variability in weather conditions. Bruand also complains that after hard winter weather, he found several of his species disappear from their usual haunts. The *Psychides*, at least such as I know, appear to feed chiefly during the winter, and to aestivate during the hotter part of the summer.

Such *Psychides* as I have had the opportunity of rearing in captivity, that is to say, those which occur, and are obtainable in Britain, are not difficult to deal with, so long as, if there be any doubt about providing proper food and surroundings, the larvae are not collected very long before pupation. I lost a number of *Luffia lapidella* from this cause, the tree-lichens at my disposal not suiting the rock-

lichen feeding larvae. My experience is thus limited to our smaller species, such as feed upon lichens and low-growing plants. The great enemy of the would-be rearer is mildew, and yet the food must be kept fairly moist, for, should it become dry the larvae cease to eat. I am now feeding my Italian *Masonias* upon dead, partly rotten, plum and other leaves, green grass, apple peel, rose petals, etc. They are also carnivorous, taking readily to dead flies, smashed Aphides, Lepidoptera, and even cooked, or raw, meat. But the consumption of food is remarkably small, and I am inclined to think that variety rather than quantity, is the desideratum with these really small larvae.

Rearing from the egg is a somewhat tedious business, as attention must be continued throughout the winter during which the greater part of the larval state is passed. I have however brought through *Fumeas*, and these *Masonias*, without much difficulty, but have never attempted to rear *Solenobias*, which appear to require a particular lichen growing upon posts and fences, rather than living wood, or upon rocks and stones, and therefore difficult to keep under natural conditions. It is necessary to confine such small captives somewhat closely, and I rear them in 4in. glass topped, metal boxes, with a little earth or sand at the bottom, a bit of lichen covered bark, and anything in the way of food which may come to hand, all kept moist and frequently renewed to avoid mildew.

I can give an example of the life-cycle of such a Psychid. Ova laid by the *Masonia* received from Count E. Turati, of Milan, in May, hatched about June 4th, 1922, and the young larvae, as is their habit, first employed their energies in fabricating their tiny, smooth cases from gnawed flakes of the inner part of some bark. They appear to have commenced to construct their "faggot" covering in August, from chopped up, fine, dry, grass stems provided for this purpose. They were eating leaves, by preference withered or dead in October, having passed a time, during the hottest weather, in quiet aestivation. I bred a male on December 21st which lived without attention until the 25th. This must have been an unusual occurrence brought about by the artificial conditions under which the insects were being reared. Since that date no more have emerged, and I have now (March) a mixture of a majority of large cases, probably nearly full size, and of a minority which are still small. Most of them are still feeding. They evince a great partiality for fresh flowers of *Laurestinus*, *Myosotis*, etc., making for the centre of the blossom in search of the nectar, it would seem. The larger larvae have been adding flat shreds of dead leaves to their cases, the result being that the customary "faggot" case is entirely altered in appearance. The captives appear to live in perfect amity, possibly so long as they are of the same family and species. But sometimes tragedies occur. I had sent to me in a small box, a *Fumea*, and a *Narycia monilifera*. Upon arrival I found that the *Fumea* had devoured its companion. Whether it had died before it was seized it is not possible to say, if not there must have been a deliberate attack on the part of the *Fumea*. Yet my *Masonias* live in peace with a number of *Psocidae*, *Poduridae*, and *Oribatidae*, and no living insects which I have introduced have suffered unless previously crippled. In these cases, and with green food, the principle desire would appear to be to extract the juices, rather than devour the substance. I have

however seen a larva of *Diplodoma herminata* with a large part of its body inside that of a dead fly.

The use of insect remains in the covering of the cases does not appear to me to be absolute evidence that the former owners had fallen victims to the wearer, but rather perhaps that the larvae had come across the remains when foraging about amongst the low growth in search of food and building material.

One very curious habit of some of these larvae has puzzled me much. While rearing *N. monilifera*, and the *Luffias*, and I believe also the *Solenobias*, I have frequently discovered cases attached opening to opening. I thought at first that these were proofs of intended murder, but examination showed that both larvae were quite well and happy. The cases are spun together by the edges of the openings. How long this conjunction continues I do not know. I have preserved a pair of these coupled cases intact, in order that I may retain evidence of the fact. This habit must, I presume, be confined to the species which reside in smooth cases, as such an association would be difficult to those which construct more complicated habitations.

Coming now to the description of individual specimens, it is necessary that I should use for the sake of brevity and compactness the numbers which I have attached to each. I must explain that I have actually several separate collections, each of which has had to receive a distinctive designation.

C.I. Nos. 1-599.—Signify Chapman's mixed accumulation of imagines of *Fumea*, *Bruandia*, and *Masonia*, and such further material as I have been able to add thereto.

E. Nos. 600-699.—assigned to *Epichnopteryx*, but scarcely used, as no important differences have been discoverable amongst the specimens of *E. pulla*.

Coll. (or C.) Nos. 700.—The inclusive collection of imagines of Palaearctic species, Chapman's, and my own additions.

C.M. Nos. 1.—Chapman's mounts.

My own mounts bear the same numbers as the imagines from which the parts were taken.

I have already stated that I have been unable to learn more about some of the new, and obscure, species included in Tutt's list. These were largely differentiated by Chapman, upon the relative position of the base of the spur upon the tibia of the front leg of the male. The formula used (Tutt p. 299) is "we may express the length of the spur by the distance of its point of origin from the end of the tibia, by a decimal . . . . This affords a specific character of some value." This formula appearing to me to be somewhat vague (inasmuch as the length of the spur does not actually come into the calculation), I appealed to the Rev. J. W. Metcalfe of Torquay (whose great devotion, and kindness in measuring for me many hundreds of specimens has been invaluable) to devise a better, clearer, form. He accordingly supplied me with the following—which exactly coincides with my idea of Chapman's meaning, and has been used by us in all measurements of the tibiae:—"For purposes of comparison, we employ the ratio of the length of the tibia beyond the origin of the spur, to the whole length of the tibia."

The great trouble remains that it is often exceedingly difficult to

decide upon the exact terminations of the tibia, as they are confused by the joints connecting with the other members, with the result that "the personal equation" largely effects the result, and I find myself frequently more or less out of agreement with both Chapman and Metcalfe. This difficulty will in a measure explain, even if it does not excuse, some of the divergences which may be discovered in the following details.

These explanations become necessary when I approach the question of the new British species separated by Chapman, and Tutt, premising that *Masonia edwardsella*, Tutt, and *Fumea germanica*, Chapman, are not British.

(To be continued.)

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### What is a Species?

By the late DR. T. A. CHAPMAN, F.R.S., F.Z.S., F.E.S.

This is an abstract question and may, according to the way in which it is approached and the kind of answer that will be accepted, be a very easy or a very difficult one. What is wanted, however, is not a reply to an *abstract* question, but a reply to the *concrete* one, Are two groups of individuals all of the same species, or is each group of a species distinct from the other; and by what criterion shall we arrive at a just conclusion?

To follow the evolution of our idea of species I may be allowed to revert for a moment to the abstract question. I may, as having a pre-Darwinian memory, refer to the answer that still found most acceptance fifty years ago, and even later; not that our present answer was wanting, but that it wanted the support that the Darwinian explanation gives. The answer was, that a species is a group of individuals all descended from separately created ancestors, presumably such a pair as was preserved by Noah, and consequently all related to one another and unrelated to any other individuals.

How far have we travelled from this conception? To frame a definition of our present idea of a species as nearly as may be in the terminology of the older one, I might say that a species is a group of individuals which might all be supposed to be descended from a single pair with distinctive characters, and within a moderate (though indefinite) period.

We suppose a species usually to arise by the isolation of a section of a pre-existing species, variation and selection producing the necessary modifications. And the new species, it is often pointed out to us, is descended, *not from a single pair*, but from the whole (possibly very large) isolated section. This is true in a sense, but *quâ* distinct species, the modified older idea of an ancestry limited to a single pair is more nearly true. The species is distinct, because it has, under an altered environment, acquired by variation and selection certain new distinct characters.

These distinct characters, preserved and cultivated because valuable under the new circumstances, may have originated in the isolated section frequently, and got lost by sheer accident, but one day an individual possessing the required character (no doubt usually in a very moderate degree) left progeny, a fair proportion of which inherited the character, and from this basis the new character in its full develop-

ment became finally built up. Probably each feature characterising the new species originated in this way from *one* individual, and so there is only one ancestor for each distinctive character, or correlated group of characters. If however we select one distinctive character of the species, we have descent from *one* ancestor, as well no doubt as from many others, but this *one* ancestor is distinctive from everything represented in the present species.

It may even be a question, how far infertility with related species may be due to the final dominance of the strain of this important primary individual. When a species is dividing into two or more distinct ones by isolation, there must be a longer or shorter period during which they are still *one* species, and finally a date at which they are perfectly distinct. Mathematically we might say, there must be a particular moment before which they are *one*, after which they are two species. Biologically, or at least experimentally, this is not the case, there is a period during which the matter remains doubtful. Probably if we had a sieve suitable for sifting the individuals, we should find that some individuals were already distinct, that others were less differentiated; still more probably, if each individual could be sifted, some of its elements would be found distinct, others still in common. This latter is probably the case in species that are, and have very long been, somewhat widely distinct species. The common elements, however, are unable to declare their affinity in face of predominance of the immeasurable elements, since all must develop more or less together.

If this be so, absolute distinction for practical purposes declares itself long before complete distinction of all the elements of the germ plasm is achieved. But going in the other direction, must we not equally conclude that we may have distinctness of the character that we look for in species, in many elements of the germ plasm, long before they have any influence in producing infertility between individuals that possess them and those that do not.

Following out the ideas thus suggested, specific distinction might be defined as immiscibility of germ plasm, and distinct species would be those where individuals possess a certain (possibly variable in different families and genera) definite proportion of such immiscible germ-plasm.

It would result from this that there may be between two races the greatest variation in the amount of specific distinctness, and that this indefiniteness is a matter of fact and not of the personal equation of the observer. This might be taken to be arguing in a circle, were it not that instances of this vagueness of specific distinctness are not rare phenomena, but abound on all hands.

What I have said gives my ideas, not of species but of what constitutes specific differentiation.

My idea of species is to take something out of this that will be useful for practical purposes.

I conclude that the races of peas experimented on by Mendel and Bateson are all of one species, but I should postulate that they possess some elements of specific distinctness. *Smerinthus ocellatus* and *populi*, on the other hand, are distinct species, but still possess some elements that are specifically identical.

Trying to frame a general test that would separate these pairs of forms that are always regarded as of one species, from those that are

always regarded as two, should incidentally give some guidance (which after all is only some useful rule for ordinary rough purposes) on the doubtful and intermediate races, the conditions force us to take one of the degrees of miscibility. What this degree shall be, must in the end, be such a practical one as will appeal to the ordinary field naturalist, is in fact dependent on the personal equation, and the personal equation must be that, if we can ascertain it, of the man who is practically dealing with specific forms in life.

Such a test seems to be that if the two forms placed together in a suitable environment, mix readily to a common and average form, then they are one species, if not, they are distinct. A common and average form must be interpreted broadly, and would include alternative and mutually exclusive variations, and so on. If the two forms appear to mix freely, and the mixed form reverts at once to one or other of the parent forms (apart from selection due to unsuitable environment) then the species are distinct.

Such a test is however a counsel of perfection, the time and pains necessary to apply it to a given case will rarely be held to be remunerative, and what we really have to do is to bring in once again the personal equation, and decide, as best we may, from our other knowledge of the two forms, what would be their behaviour were such a test applied.

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### Entomological Notes from Putney for 1922.

By H. DONISTHORPE, F.Z.S., F.E.S.

January 11th.—*Forficula auricularia*, out on footpath.

February 23rd.—*Coccinella bipuncta*, on a fence.

February 28th.—A ♂ of *Apis mellifica*, on the wing.

March 8th.—*Vespa vulgaris* ♀, on the wing.

April 15th.—*Coccinella 7-punctata*, on a fence; *Vespa vulgaris* ♀, on the wing.

April 23rd.—*Bombus* sp.? flying in my garden.

April 29th.—*Geotrupes sylvaticus*, a very small brightly coloured specimen walking on Putney Common.

May 20th.—*Phymatocera aterrima* (Solomon's Seal Saw-fly), flying in my garden.

May 22nd.—*Atomaria linearis*, flew into my study window.

May 23rd.—*Phlogophora meticulosa* (the Angleshades Moth), on a fence.

June 2nd.—*Pygaera bucephala* (Buff-tip), and *Lucanus cervus*, on a fence in my garden.

July 18th.—*Lucanus cervus* ♀, on a fence in Oakhill Road.

July 20th.—*Rhizotrogus solstitialis*, quite a small specimen at large in my garden. This is the first time I have noticed this beetle at Putney, though no doubt it is not uncommon. In July, 1920, however, I let loose in my garden a number of specimens which I had brought up from Cornwall; and the specimen in question may have sprung from them.

August 10th.—*Calathus flavipes*, on the pavement.

August 24th.—*Pyrameis atalanta* (the Red Admiral), in the garden; *Tenebrio molitor*, on the pavement.

September 18th.—*Pentatoma rufipes*, in Hazlewell Road; a specimen was taken near the same spot on September 15th, 1920.

September 20th.—*Oxytelus sculpturatus*, on a window in my study.

September 21st.—A large green Dragon-fly was observed flying up and down Hazlewell Road, and hawking winged ants during a marriage flight of the latter.

October 1st.—A number of small Lepidopterous larvae were hanging by threads from the Laburnum tree in the front garden. I unfortunately did not capture any at the time, and I did not see them again.

October 7th.—*Tortrix pronubana*, flying in some numbers in my garden. This species was very abundant all over Putney in 1922. The grass-hopper, recorded in 1920, was very common in my garden in 1922. I had never seen it previous to August 28th, 1920.

October 8th.—*Vespa vulgaris* ♂, flying in Hazlewell Road.

October 26th.—Quite a number of ♂ wasps (*Vespa vulgaris*) were noticed in the window of a confectioner's shop in East Putney.

November 8th and 25th.—A specimen of *Geotrupes spiniger*, on the pavement in Hazlewell Road. On October 15th, 1892, I took a number of this species in fields at Putney, situated just about where my house stands to-day!

December 12th.—*Coccinella 7-punctata*, on my fence.

December 24th.—A Queen Wasp (*Vespa vulgaris*), picked up in a dormant condition on the pavement. When brought into a warm room she revived and crawled about, but went to sleep again when placed in a cold room.

December 29th.—*Pseudococcus gahani*. The colony of this scale insect recorded on October 29th, 1921, which occurred on a Laburnum tree in Oakhill Road, was as abundant, or more so, than ever.

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### The Distress of Russian Entomologists.

At a recent meeting of the Entomological Society of London, the sum of 20 dollars was voted by the Society, and another 20 dollars subscribed among the Fellows, to send a remittance of food and clothing to the President of the Russian Entomological Society, Andrei Petrovich Semenov-Tian-Shansky, Hon.F.E.S., who is living under distressful conditions in Petrograd; yet in spite of this, and of his rapidly failing eyesight, he is continuing to carry on his entomological work.

The Russian Entomological Society, under his guidance and encouraged by his devotion and enthusiasm, is also carrying on its labours; in the face of innumerable difficulties, the members have succeeded in producing their Review, copies of which have reached England. The splendid work done by this school of Entomologists is, perhaps, not well enough known in Britain, except to specialists, but it is almost to them alone that we owe our present knowledge, which is considerable, of the immensely rich, interesting and important fauna of Central Asia, Siberia and the Caucasus. Yet these men can scarcely keep body and soul together, and many have families to support, while few can buy the clothing which is urgently needed. This state of affairs must seriously prejudice the efficiency of their scientific work and thus hinder the progress of Entomology.

In order to help them, a small committee has been formed, with the object of collecting funds and remitting them to the Russian Entomological Society, to be employed as their Council thinks fit, in aiding the members in need either with food or clothing. Moderate sums of money can now be remitted to Petrograd or Moscow. This committee consists of Mr. Arthur Dicksee, F.E.S., Mr. B. P. Uvarov, at the Natural History Museum, and Dr Burr. Any sympathiser is requested to communicate with either of these, preferably enclosing a remittance, however small, for a few shillings will to-day buy millions of roubles, and will help a Russian colleague to carry on the struggle and his scientific work for the benefit of the Science which we all love.

All British Entomologists, who enjoy happier conditions, cannot but feel the greatest sympathy for their Russian brethren under these pitiable circumstances, especially those who have connections by correspondence, friendship, or scientific relationship, above all, those who have at any time enjoyed the famous and lavish hospitality of that generous people, and probably many will welcome an opportunity of contributing to their assistance, to help them tide over until better days.

Arthur Dicksee, F.E.S., 7, Duke Street, St. James. S.W.1.

B. P. Uvarov, F.E.S., Natural History Museum, Cromwell Road, S.W.7.

Malcolm Burr, F.E.S., United University Club, Pall Mall East, S.W.1.

## NOTES ON COLLECTING, etc.

WARWICKSHIRE RECORDS OF ICHNEUMONINÆ (TRYPHONINÆ).—*Polyclistus mansuetor*, Gr.—Stoke, 24.viii.19; 8.ix.20; 8.viii.21. *Orthocentrus fulvipes*, Gr.—Stoke, 10.v.21. *Bassus laetatorius*, Fab.—Stoke, 14.vi.20; 26.vi.20; Coombe, 15.viii.20; Brinklow, 2.viii.20. *B. trincinctus*, Gr.—Stoke, viii.16; 5.vi.19; 1.x.19; 30.vii.20; 9.vii.20. *Homocidus biguttatus*, Gr.—Stoke, vi.16; 7.vi.21; 10.vi.21. *H. flavolineatus*, Gr.—Ryton, 6.vi.20. *H. tarsatorius*, Pz.—Stoke, 8.ix.20; 8.viii.21; 20.vi.21; 29.v.21; Brandon, iv.16. *H. deplanatus*, Gr.—Brandon, 2.xi.19. *H. dimidiatus*, Schr.—Stoke, 6.ix.19. *Promethus sulcator*, Gr.—Brandon, 24.viii.19; Brinklow, 2.viii.20; Stoke, 8.viii.20. *P. cognatus*, Hlgr.—Brinklow, 27.vii.19. *Protarchus rufus*, Gr.—Bubbenhall, 29.vi.19, H. G. Wagstaff. *Mesoleius virgultorum*, Gr.—Brandon, 12.vi.21. Rare. *M. semicaligatus*, Gr.—Bubbenhall, 14.viii.19. *M. aulicus*, Gr.—Coleshill Bog, 14.vii.20 (host, *Pteronus (Lophyrus) pini*); Stockton, 28.viii.20; Stoke, 11.vi.21. *M. variegatus*, Jkr.—Coleshill Bog, 11.x.19; 26.v.20. *M. formosus*, Gr.—Stoke, 29.v.21. *M. filicornis*, Hlgr.—Stoke, ix.16, ♀. *M. niger*, Gr.—Bubbenhall, 18.v.19; Ryton, 5.vii.19. *Dyspetes praerogator*, L.—Stoke, viii.16; ix.16; Tile Hill, 23.viii.19; Kenilworth, 28.viii.21. *Tryphon elongator*, Fab.—Stoke, 20.vi.21. *T. rutilator*, L.—Stoke, 4.vi.17; 30.v.21; Coombe, 29.v.21. *T. vulgaris*, Hlgr.—Bubbenhall, 7.vi.19; Corley, 28.v.20; Coleshill Bog,\* 4.vii.20 (host, *Pteronus pini*). *T. consobrinus*, Hlgr.—Ryton, 5.vii.19. *Acrotomus succinctus*, Gr.—Ryton, 10.vii.21. *Ecenterus aurifluus*, Hal.—Brandon, 4.ix.21. *Mesoleptus typhae*, Frc.—Ryton, 11.vii.21; Kenilworth, 28.viii.21. *M. ruficornis*, Gr.—

Brinklow, 12.ix.20. *Cataglyphus fortipes*, Gr.—Bubbenhall, 7.vi.19. *C. fuscicornis*, Gr.—Stoke, 26.v.20; 4.vii.20; 7.viii.21; Coombe, 15.vii.20. *Euryproctus geniculatus*, Gr.—Brandon, 17.vii.17. *E. atomator*, Müll.—Stoke, viii.16. *E. notatus*, Gr.—Smockington, 7.viii.20. *Perilissus filicornis*, Gr.—Binley, 27.v.16; Brandon, 1.vi.19; Stoke, 1.vi.19; Wyken, 30.v.20. *P. luteolator*, Gr.—Stoke, 29.v.19 (host, *Priophorus tener*). *Prionopoda stictica*, Fab.—Generally distributed. *P. glabra*, Bdg.—Bubbenhall, 29.vi.19. *Lathrolestus unguularis*, Thms.—Stoke, 24.vi.19. *Polyblastus variitarsus*, Gr.—Stoke, 26.vi.20; Brandon, 4.ix.21. *P. pratensis*, Gr.—Stoke, 2.vi.20.—(*To be continued.*)—J. W. SAUNT, 53, Enfield Road, Stoke, Coventry.

EARLY EMERGENCE OF *PIERIS RAPAE*.—It may be of interest to record that I captured a male specimen of *P. rapae* flying round a lighted gas chandelier in a chapel at East Dulwich, at 8 p.m. on Sunday, March 11th, 1923.—ALICE K. LOCK (Miss), 77, Grove Hill Road, Denmark Park, S.E. 5.

RECORDS OF ANOPHELES SPECIES.—The following particulars are taken from notes I made at the time.

*Anopheles plumbeus*, Stph., = *nigripes*, Stacy.

“♂♂ flying in small swarms, at 8.15 p.m. (proper time) in the open, away from trees, up and down vertically, about six to eight feet above the ground. There were no large trees near, only small bushes about 20 yards off. First met with on June 3rd, 1915, and again in the same place on June 11th, 1915, in Hogley Bog, Oxford.”

I again met with ♂♂ flying in a small swarm, at about the same time in the evening, in another locality, on August 14th, 1915, near Bayswater Mill, Oxford. On this occasion, although they were in the open, there were many large trees comparatively near.

*A. bifurcatus*, L., ♂♂ also fly in a similar way, in the open, my notes give, “flying in small swarms at 6.15 p.m. (summer time), in a clay pit, Shotover Hill, Oxford, on September 22nd, 1917.”—A. H. HAMM (F.E.S.), 22, Southfield Road, Oxford.

COCCINELLA 11-PUNCTATA AB. **lemanii**, N.A.B.—I recently submitted to MESSRS. G. B. C. Leman and H. Donisthorpe a number of my *Coccinellidae* captures for their kind help in classification as to varieties, aberrations, etc., and among the *C. 11-punctata*, L., submitted one which, so far, has not been described or recorded. The scutellar spot is absent, and only two spots appear on each elytron, its formula being—3, 5. The specimen was taken at Burgh near Carlisle, on June 3rd, 1922. Since a careful search shows no previous record of this aberration, I propose, with Mr. Leman's consent, to name it after him as some small acknowledgment of his work on the group, and his kindness in giving unsparingly his help and encouragement whenever it is sought. *C. 11-punctata* ab. **lemanii**. Formula—3, 5.—T. F. MARRINER (F.E.S.), 2, Brunswick Street, Carlisle. *March 17th, 1923.*

LA SAINTE BAUME IN JULY, 1922, AND A CORRECTION.—In Mr. E. B. Ashby's interesting paper on his captures last year, in the Sainte

Baume district, published in this month's *Record*, I note he mentions having taken *Melanargia arge*\* near Ste. Baume. This, of course, must be a mistake, as this insect is only found in Spain and Sicily, and has never been recorded from the south of France.

With regard to *Satyrus briseis* which is abundant near the Hotellerie at Ste. Baume, the female form, var. *pirata*, is found here, as Mr. Ashby states, not uncommonly, some of those which I took in 1920 being of very large size. This variety differs from the type, in the colour of the light bands of the upperside of the front wings, which are rich reddish ochre-yellow, instead of white, in fact it is almost exactly similar in colour and general appearance to the female var. *uhagonis* of *Satyrus priouri*, which of course is only found at Albarracin in Central Spain. There however, curiously enough, var. *pirata* is not found, all the females being typical *briseis*, and the form a small and somewhat insignificant one.—G. H. GURNEY, F.E.S., Keswick Hall, Norwich.

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## CURRENT NOTES AND SHORT NOTICES.

Parts III. and IV. of the *Transactions of the Entomological Society of London* should now be in the hands of all the Fellows, and the concluding part consisting of the Proceedings only is well on the way. The present issue contains 320 pages and 32 plates, 4 being coloured. The paper which will appeal most to British entomologists is that by Mr. C. L. Withycombe, M.Sc., entitled "Notes on the Biology of some British Neuroptera," with six excellent plates in black and white; it describes the author's researches in the little known habits and structure of some of the *Osmylidae*, *Hemerobiidae*, *Chrysopidae*, and *Coniopterygidae*. Mr. N. D. Riley's account of the *Rhopalocera* found on the Mount Everest Expedition of 1921 is another interesting paper unfortunately marred by one of the plates. One of the most valuable papers is the "Monograph of the Genus *Catochrysops*," by Mr. G. T. Bethune-Baker, with twenty plates, three of which are coloured; the paper contains a thorough investigation of the genitalia and of the androconia, of which the bulk of the plates portray the details.

The attention of Entomologists throughout the world is called to the fact that, beginning with the Volume of 1922, the preparation of the "Insecta" part of the *Zoological Record* is being undertaken by the Imperial Bureau of Entomology. In order that the *Record* may be as complete as it is possible to make it, all authors of entomological papers, especially of systematic ones, are requested to send separata of their papers to the Bureau. *These are particularly desired in cases where the original journal is one that is not primarily devoted to entomology.* All separata should be addressed to:—The Assistant Director, Imperial Bureau of Entomology, 41, Queen's Gate, London, S.W.7.

The second part of the first volume of the *Bulletin of the Hill Museum* was issued a short while ago. This deals almost exclusively with new forms of Lepidoptera of which such quantities have been obtained by Mr. Joicey's collectors in New Guinea, Central Ceram,

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\* By a curious error *Arge* (gen.) was printed *M. arge*.—H.J.T.

Sumatra, S. America, etc., etc. Mr. G. Talbot is responsible for much of the work, whilst Sir George Hampson deals with new *Noctuidae* and Mr. L. B. Prout with the Geometers. Prof. Poulton has a note on a case of mimetic resemblance and Mr. Talbot gives some notes and remarks on nomenclature, which originated in the remarks made in the short review of part 1 in this magazine. There are no figures in part 2, but the new species will be fully illustrated in part 3, which is promised at an early date, together with the Index of Vol. I.

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## SOCIETIES.

### THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

December 16th.—NEW MEMBERS.—MESSRS. W. H. T. Tams, 19, Sullivan Road, Hurlingham, S.W. 6; F. G. Mann, B.Sc., Chemical Laboratories, Pembroke Street, Cambridge; and John Robertson, M.R.C.S., L.R.C.P., F.Z.S., 69, Bedford Road, S.W. 4, were elected.

EXHIBITS.—Mr. C. Withycombe showed the following species of Neuroptera in support of the fact that in the Order there often appears to be a tendency to reduction of the hindwings, but as a rule not to complete reduction; *Glenoleon indecisum* (Queensland), *Cymothales* sp. (Africa), *Chasmodon sheppardi* (Asia Minor), *Nemoptera bipennis* (Spain), etc.

Mr. R. Adkin, a series of *Zygaena* sp. reared from pupae sent him by Lord Rothschild, from the Chilterns, near Tring. Fifty-seven examples were six-spotted, and sixteen were five-spotted. When left to themselves there were no cross-pairings between the forms. He regarded the latter as *Z. loniceræ*.

Mr. Hy. J. Turner, Mr. A. E. Tonge, Mr. Grosvenor, and Col. Rattray exhibited various species, forms and races of *Zygaenidae*.

Mr. T. H. L. Grosvenor read a paper entitled "Notes on the *Zygaenidae*," and a discussion ensued, it being generally stated that what was meant by the name *hippocrepidis* was not known, and surprise was expressed that confluence in the various species did not exhibit Mendelian characters.

January 11th, 1923.—NEW MEMBERS.—MESSRS. H. Baker-Sly, "Kingston," Edenbridge, Kent; J. P. Mutch, Church Road, Bexley Heath; C. J. V. Gray, School House, Bradfield College, Berks; R. C. Fisher, B.Sc., Forestry Museum, Kew Gardens; and L. G. Bowles, 193, Brockley Road, S.E., were elected.

EXHIBITS.—Mr. H. Moore, showed ♂ and ♀ *Argema moenas*, the Assam long-tailed silk-moth, and an *Arctia caja* of very aberrant coloration, which latter he was presenting to the Society's Collection.

Mr. A. A. W. Buckstone, a bred series of *Pyrameis atalanta*, the pupae having been exposed to a fluctuating warm temperature, and pointed out the emphasis of the yellow coloration, and a similarly circumstanced series of *Aglais urticae*, of which the yellow coloration was also pronounced.

Mr Hy. J. Turner, a series of the beautiful *Colias*, *C. behri* taken in the Yosemite region of California at 9700 ft. elevation by Mr. G. B.

Pearson; a pair of the N. American Parnassiid, *Parnassius clodius*; a short series of the very small Pierid *Nathalis iole*; etc.

PAPERS.—Mr. G. W. Young, F.Z.S., read a paper entitled "The Geological History of Insects" and showed a series of lantern slides in illustration.

Mr. R. Adkin, as delegate to the Conference of Corresponding Societies of the British Association, read his report of the Meeting at Hull.

January 25th.—ANNUAL MEETING.—The Report of the Council, Treasurer's Statement and Balance Sheet were received and adopted. The Officers and Council for the following year were elected. The President read his address, dealing first with the affairs of the Society and the obituaries of deceased members and devoting the main portion of his address to an account of his sojourn in the Canadian wilds, illustrating it with numerous species of various orders. The new President, Mr. N. D. Riley then took the chair and votes of thanks were passed to the retiring Officers.

ORDINARY MEETING.—Mr. J. W. Munro, D.Sc., Green Lawn, Kew Road, Richmond, was elected a member.

Mr. Frohawk exhibited an aberrational series of *Papilio machaon* including one of a rich deep ochreous yellow colour, captured at Herne Bay in August, 1857, and another of a dull buff ground very dark, bred in 1895 from Wicken Fen. He also showed a number of Diptera taken from the crop of a grouse in December last.

#### THE ENTOMOLOGICAL SOCIETY OF LONDON.

January 17th.—ANNUAL MEETING.—Dr. S. A. Neave read the Report of the Council, which was adopted on the motion of Mr. G. T. Bethune-Baker, seconded by Commdr. J. J. Walker.

Mr. W. G. Sheldon, the Treasurer, read his Report and gave some details of the highly satisfactory financial condition of the Society. The Report and Accounts were adopted unanimously on the motion of Dr. C. J. Gahan, seconded by Mr. W. Rait-Smith.

It was announced from the Chair that the Fellows nominated as Officers and Council for the ensuing year had been duly elected in accordance with the Bye-Laws.

In the absence of the President owing to illness, his address "On some Aspects of Variation in Lepidoptera" was read by Dr. S. A. Neave, and at its conclusion a vote of thanks to the President, coupled with a request that it might be printed in the Proceedings, was moved by Mr. E. E. Green, seconded by Mr. G. T. Bethune-Baker, and carried unanimously.

A vote of thanks to the Officers for their services was then passed on the motion of Professor E. B. Poulton, seconded by the Rev. F. D. Morice, and Mr. W. G. Sheldon, Dr. S. A. Neave, and Mr. H. J. Turner briefly replied.

February 7th.—NOMINATION of VICE-PRESIDENTS.—The President announced that he had nominated Mr. J. E. Collin, Professor E. B. Poulton, F.R.S., and Lord Rothschild, F.R.S., as Vice-Presidents for the ensuing year.

**ELECTION OF FELLOWS.**—The following were elected Fellows of the Society:—Mr. G. D. Millward, 32, Moorgate, E.C. 2. Mr. Harold Wilkinson, Rheindeer Hotel, Burnley, Lancashire. Mr. J. D. Dean, 20, St. Fagan's Road, Ely, Cardiff.

**EXHIBITIONS.**—Capt. K. J. Hayward exhibited an interesting series of *Danaüs chrysippus* from Upper Egypt, and also a melanic aberration of *Polygonia c-album*.

Mr. H. Donisthorpe brought for exhibition living examples of *Acanthomyops brunneus*, Latr., an ant new to the British list.

Dr. F. A. Dixey, F.R.S., exhibited a little known Pierine from Fiji and a specimen of *Euchloë ausonia* race *egyptiaca* from Western Egypt.

Professor E. B. Poulton, F.R.S., exhibited a dragon-fly, *Aciagrion occidentale*, taken at sea 60 miles west of Colombo.

He also exhibited some specimens as evidence of colour adjustments in the wild pupae of *Pieris rapae*, and made further observations on the protective resemblance of *Polygonia c-album* and the attacks of enemies on British butterflies.

He further exhibited some remarkable "all-female" families of *Hypolimnas bolina*, L., bred in Fiji by Mr. H. W. Simmonds.

Mr. H. J. Turner exhibited a short series of *Argynnis atossa*, Edw., from South California.

Dr. K. Jordan, F.R.S., exhibited some specimens of Geometrids and pointed out that the insect known as *Anaitis plagiata* consists of two species, the true *A. plagiata*, L., and the smaller and paler *A. efformata*, Gn., both species occurring in Britain, whereas only *A. efformata* is found south of the Mediterranean and in Southern Spain and Portugal.

Mr. C. L. Withycombe, who illustrated his remarks with lantern slides, gave some particulars of three genera of *Nemopteridae* and their larvae.

#### LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

*February 20th, 1923.*—Three new members were elected; and a resolution was passed admitting Junior Members to the Society at a reduced subscription in order to encourage beginners. Unfortunately Professor Newstead was unable to deliver his lecture, being called away through sickness in his family. We hope perhaps to hear his lecture at the April meeting. The Annual Dinner has been postponed until the Autumn. We were fortunate in having Mr. Mansbridge to exhibit and explain a beautiful collection of about 70 lantern slides which he had on loan from Mr. Hugh Main. We certainly always will welcome such beautiful work as Mr. Main's whenever we have the opportunity of seeing it.

Mr. Mansbridge then exhibited a single specimen of a species of Lepidoptera new to Britain called *Auximobasis normalis*, Meyr., which he found on the dock wall, Liverpool, in September, 1921. It was probably imported as a larva or pupa. Mr. Edward Meyrick has a series from Ecuador and Columbia. Twenty-five species are known belonging to the genus *Auximobasis*. The larval habits of *normalis* are not yet known. It is probably a seed eater. He also showed a series of *Peronea hastiana* from the Isle of Wight, comprising vars. *divisana*, *radiana*, *centrovittana*, *combustana* and *brunneana*, with corresponding varieties from Lancashire localities for comparison. It

was seen that the Lancashire specimens were all very much darker than the parallel forms from the Isle of Wight. Mr. Tyerman also exhibited a very variable series of the same species which he had bred from Lancashire larvae last year.

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## REVIEWS AND NOTICES OF BOOKS.

ENTOMOLOGY WITH SPECIAL REFERENCE TO ITS ECOLOGICAL ASPECTS.  
—By J. W. Folsom, Sc.D. (Harvard), with 5 plates and 308 Text-Figures. Published by John Murray. 21s. net.

This volume gives a comprehensive yet concise account of insects, treating entomology from the biological side.

The author has evidently read widely and gives us the results of his studies in a succinct and clear form. The book (extending to 502 pp.) is packed with interesting facts from cover to cover. Almost every page suggests lines of study which specialists should take up and carry investigation yet farther. That way progress lies.

Moreover we are given an exhaustive and therefore useful entomological bibliography, arranged under appropriate headings, so that a student with a bias towards a certain phase of the subject can read up all that has been done up to 1923, and having this as a basis, can experiment as seems to him best, with a view of further discovery.

The first chapter deals with classification—each Order and Sub-order being accompanied by a clear illustration of a typical specimen. As a rule only the commoner kinds of insects are referred to, so that the reader can easily procure the material, and use the text as a guide to personal observation.

Then follows a chapter on anatomy and physiology—well illustrated—and also one on development. The metamorphosis of *Anosia plexippus*, as an example of a holometabolous insect, is shown step by step, from the full-fed larva up to the emergence of the perfect insect when it is ready for flight. This is done in fifteen stages.

Chapter V. dealing with Color and Coloration is fairly exhaustive, touching as it does on the results of the studies of scientists of the calibre of Merrifield, Poulton, Weismann, Kellog, Mayer, Wallace, Edwards, Standfuss, etc.

Next in order is a chapter on adaptive coloration and protective mimicry giving briefly the results of the studies of Dr. Dixey, Marshall, Wallace, Trimen, etc., and a short dissertation on Batesian and Müllerian mimicry. Continuing are chapters dealing with "Insects in Relation to Plants," "Insects in Relation to other Animals," and "Transmission of Diseases by Insects." Whilst this is on the whole well written, it is rather a shock to find that the results of experiments by Bacot are not given. The subject of Insect Behaviour is considered under the the three heads (1) Tropisms, (2) Instinct, (3) Intelligence. That on Tropisms, is further subdivided into Chemotropism, Hydrotropism, Thigmotropism (negative and positive), Rheotropism, Anemotropism, Geotropism, etc.

The Chapter on "Distribution" is subdivided into (1) Geographical, and (2) Geological, whilst that on "Insect Ecology" is a feature of the work.

We have no doubt that all real students and not a few of the most intelligent general readers will welcome this work of Professor Folsom.  
—H.E.P.

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AND

# Journal of Variation

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## Six Weeks among the Butterflies of Eastern Switzerland. (With Plate.)

By B. C. S. WARREN, F.E.S.

The entomologist who visits such classical collecting grounds as the neighbourhood of Pontresina and the Albula Pass, for the first time, will doubtless derive great pleasure in anticipating the numerous and varied forms of Lepidoptera which he hopes to find, and for which these localities are celebrated. But it will not occur to him that, in addition to this pleasure, there will be any likelihood of his being able to add anything to what is already known of these localities, or of the geographical distribution of the species inhabiting them. That usually is regarded as a pleasure and reward reserved for the collector, who ventures into unknown districts and takes his chance of drawing success or a blank.

However, it had long been my wish to collect in the famous valleys of the Engadine, having never penetrated east of the Schyn Pass, so, when last summer the opportunity offered, I decided to indulge in the pleasure of becoming personally acquainted with the localities which have, probably, been collected in by every English entomologist who has ever collected abroad, and subsequently to spend some little time on the Ofen Pass, in hopes of adding something of interest to our knowledge of the butterflies of Eastern Switzerland; for the latter locality has, so far as I can ascertain, received but little attention from Swiss collectors; while the only English collector who appears to have left any record of a visit there was our late Editor, who on one occasion spent a day or two at Zernetz on his way further east.

In carrying out this programme things turned out in a very unexpected manner. The Ofen district proved quite as interesting as I hoped it would; but the time spent in the Upper Engadine produced so many surprises that I felt they should be recorded, and so have ventured to offer yet one more account of the butterflies of these glorious localities to the readers of the *Entomologist's Record*.

We, that is to say my wife and myself, arrived at Pontresina on the afternoon of June 30th, and the weather gave us the first pleasant surprise of our stay. All that day the journey from Zurich had been under grey skies with occasional showers, which turned to continuous rain as we began to ascend the valley of the Albula. By the time Preda was reached, at the mouth of the tunnel, the clouds were right down in the valley, shutting out all view, and the rain was falling in a steady deluge. Our surprise then can easily be imagined when we emerged from the tunnel to find a cloudless blue sky and bright sunshine; which conditions lasted for the next week in the Engadine, although most of the time the clouds never lifted off the heights of the Albula.

The following morning, July 1st, we began collecting in the Roseg Tal. This magnificent valley, and the Alps to which it leads, form without doubt the finest collecting grounds of the neighbourhood. On this day we ascended the valley to the junction of the Tschierva and Roseg glaciers, and went some way up the lateral moraine of the former, on its right side, having accidentally got on the old path, instead of the new one, which leads to the Tschierva Hut. Scrambling over the chaos of loose stones and rocks, which now cover the old path,

MAY 15TH, 1923.

proved, in the blazing sun, such exhausting work, that we turned back shortly after lunch. The species noted all through the valley before reaching the glacier were, however, of a very interesting nature, and mostly in beautifully fresh condition. The outstanding feature was on this occasion, and every subsequent one, the number of species of Argynnids and Melitaeids which were met with. At first, as for the greater part, they were only just emerging, none were in great abundance. *Melitaea dictynna*, *M. matura* race *wolfensbergeri*, and *Brenthis euprosyne* were most in evidence; but *B. pales*, type form and var. *isis*, *B. amathusia*, *M. varia*, and *M. aurinia* race *merope* were all taken, and though I did not find the particular places to which *B. thore* seems addicted, on this day, there is no doubt from the condition of my subsequent captures it must have been already on the wing. Among the other species noted or taken were *Hesperia cacialiae* and *H. malvoides*, single specimens of each; *Aricia eumedon*, *Cupido minimus*, *Albulina pheretes*, *Pieris rapae*, *P. napi* race *bryoniae*, *Papilio machaon*, and numerous worn examples of *Pararge hiera*. *Erebia lappona* was the only species noted at the higher level by the glacier. I may perhaps add here, that in our numerous excursions up the Roseg Tal we always went up by the footpath through the woods, on the right bank of the river, and found it, after the first mile or two, most excellent collecting ground.

The following day we again went to the Tschierva glacier, and getting on the right path we eventually reached some beautiful grass slopes, on the south side of Piz Tschierva, above the glacier and the Tschierva Hut (which latter is built on the top of one of the ancient lateral moraines, which is here quite 100 feet high), and facing the great ice falls on the Piz Bernina. On the way up the path crosses some very fine grass-covered slopes, known as the Alp Misaum, which, however, do not seem at all so good for insects as the upper slopes. The path then curves round a spur of the Piz Tschierva, in a south-east direction, and after a steep ascent runs along, only rising very slightly above the glacier, towards the Piz Bernina, with the moraine just below on the right, the slopes first mentioned on the left. These slopes, which are at an altitude of about 7,500 feet, and ascend some 400 feet, were swarming with butterflies; they carried out the traditions of the Roseg Tal, in that the Melitaeas quite outnumbered everything else. *M. cynthia*, *M. varia*, and *M. aurinia* race *merope* were in perfect condition, and the ♂s in great numbers, the ♀s being still scarce. The rocks below the path produced a few *Pontia callidice*. *Lycaena arion* var. *obscura*, *Erebia gorge* (type), and *E. lappona* completing the list of species present.

These slopes, backed by the great cliffs of Piz Tschierva, and surrounded in front by glaciers and snow peaks, form a typical Alpine collecting ground, in the most perfect setting imaginable. It is, however, a long way to them from Pontresina, a good sixteen miles there and back, with a rise of 1,500 feet to their foot; it is therefore wise to make an early start and get over as much as possible of the walk in the cool of the morning.

In endeavouring to ascertain the position of the best collecting ground above the Tschierva glacier I had a particular object in view. In Mr. Wheeler's *Butterflies of Switzerland*, among the localities mentioned for *Erebia flavofasciata* is "Tschierva glacier behind restaurant,

1. ♂ .10.vii.01 Fison." This record has since been twice published by Miss [redacted] among notes of the late Mr. A. J. Fison, in slightly varying forms. In the *Entomologist's Record*, 1914, on page 229, we find, "I also took a *flavofasciata*, 10.viii.01, on steep slopes east of Tschierva Hut, and another ascending to it on grass slopes above junction of the two glaciers." In last January's number of this magazine, page 12, "*E. flavofasciata* . . . . Tschierva glacier 30 mins. below and behind Restaurant, 1. ♂ .10.vii.01; none there in 1904; first found about 1850." This latter record agrees with the one in Mr. Wheeler's book, as to the date; the other gives the date as viii. and mentions two specimens. Although outside the scope of this paper, one may remark on the date, 1850, stated by Mr. Fison as the year of the first discovery of *E. flavofasciata*. One wonders what his reason for this statement was; for Col. von Nolte was supposed to be the discoverer of the species, in 1893. Did some other collector previously come across it, and if so, who?

To return to the records. Mr. Fison failed to discover any further sign of *E. flavofasciata* in the Tschierva locality in 1904; and during the twenty-one years that had elapsed since he got his two specimens, there had been no further record of the occurrence of the species in that locality. That those two specimens could have, by chance, travelled almost to the foot of the Piz Bernina from the Schafberg seemed practically impossible; especially when we consider the fact, that although neither on the Schafberg nor on the Alpe Pianascio is there any natural barrier to keep the species in its elevated home, yet it never extends its habitat downwards. In both cases the vegetation extends in unaltered character, for many hundreds of feet downwards from the lowest level at which the species flies. We can only assume there is something unsuitable to the species below a certain level, and it consequently feels no inclination to descend. The chance then, that two specimens should have descended into the Bernina Valley, and travelled the whole length of the Roseg Tal, and then have crossed several miles of Alps to the neighbourhood of the Tschierva Hut, seemed so improbable, that I felt sure *flavofasciata* must be located somewhere in that neighbourhood. The strange thing was, if this were so, how had such a much sought species avoided detection by the numerous collectors who go annually to Pontresina, especially as they had Mr. Fison's record to help them?

The hope of solving this problem then, was what led me to the Tschierva glacier, though it cannot be said I had much real hope of success. On the occasion of our first visit to the Tschierva slopes one thing seemed quite obvious. These slopes were ideal ground for *flavofasciata*; and even if they were not, there was no other ground for butterflies in the neighbourhood; therefore I concluded they were the home of the species, and that Mr. Fison's want of success in 1904 was owing to the confusion of dates in his notes, and that he was too late, so I determined to return in a week's time, and make sure.

It was well on in the afternoon when we returned to Pontresina, and very little was seen through the woods of the Roseg Tal. The following day we felt in need of a certain amount of rest, after two very trying days, so it was not until the afternoon that any collecting was done, when we went part of the way up the Schafberg.

About half way up to the first restaurant (or what used to be the

first restaurant, for now it is unused) a few worn *Erebia evias* were met with; *Coenonympha satyrion* was abundant, as were a few other ordinary species, and two ♂ *Colias palaeno*, were also taken. In the fields just behind Pontresina, through which the path up the Schafberg passes before reaching the woods, a number of *Chrysophanus hippothoe* var. *eurybia* were flying; ♂s only on this occasion.

The next day, July 4th, we spent in the Morteratsch valley. Going by train to Morteratsch we walked from there to the Boval Hut. It may be said at once that the west side of this valley is quite the least productive locality for Lepidoptera in the Pontresina district. Shortly before getting to the Boval a few *Lycaena alcon* were taken, with *L. arion*. The only other species noted up to this being *Brenthis pales*, *B. euphrosyne*, *Cyaniris semiargus*, and *Colias palaeno*. At the head of the valley, near the Hut, a few *Melitaea aurinia* race *merope*, and three ♂ and one perfect ♀ *Pontia callidice* were taken. The only other butterflies seen being *Erebia lappona* and *E. gorge*. The scenery, however, makes this valley well worth a visit for its own sake, and compensates one for the very poor results to be obtained in the entomological line.

The continuance of absolutely perfect weather led us next day to try the ascent of the Piz Languard. We succeeded in reaching an altitude of almost 10,000 feet, a little over 700 feet from the summit, but then had to turn back, as the path, just 14 inches wide, was in very bad condition, and we did not wish to take the risk of its becoming worse. As it turned out, we heard afterwards, we might have safely gone on, as the path in that part is always in the condition in which we found it, and no worse higher up. On the cone of the mountain we saw no butterflies, but on the alp at the foot of the cone, at just over 9,500 feet, we came on a few insects, of which *Pontia callidice* and *Erebia lappona* were the most abundant. Among the latter I was glad to get one perfect specimen, very close to the rare ab. *caeca*, Favre. On the way down, through the Languard Tal. the following species were taken, though none were at all plentiful: *Erebia glacialis*, *E. gorge*, *Parnassius delius*, *Papilio machaon*, *Pieris brassicae*, *P. rapae* and *P. napi* race *bryoniae*, *Melitaea cynthia*, *M. aurinia* race *merope*, *Brenthis pales*, and *Aglais urticae*.

The next two days were cloudy and not suitable for long excursions, but the first two *Erebia mnestra* were taken in the Roseg Tal. *Hesperia serratulae*, ♂ and ♀, were another addition to the species so far seen; and on the lower Schafberg slopes two lovely ♀ *Colias palaeno* ab. *herrichi* were a welcome addition, but cost me near an hour's hard work to catch, which trouble I would certainly have spared myself had I then known the extraordinary numbers of this species which I was going to meet with later on.

July 8th, was once more beautifully fine, and was devoted to the Roseg Tal. This day I came on *Brenthis thore* for the first time, and found that it was quite abundant up the rocky sides of the valley, and here and there at the foot of the cliffs, but it did not seem to frequent the glades through the wood, as I had been led to suppose it did. The ♂s were quite plentiful and in varying condition, some quite fresh and many worn, so I feel sure they had been out in these particular places for more than a week. In about an hour I obtained a beautiful series of ♂s and three ♀s. On this day, too, the ♀s of *Melitaea matura* race *wolfensbergeri* were fairly numerous, and *Erebia tyndarus* made its

first appearance. A very remarkable capture was a quite worn ♀ *Pontia daplidice*, near the top of the valley. According to Frey (Wheeler's *Butts. of Switz.*, page 62), *daplidice* is not found in the Grisons; and I think the altitude, between 6,200 and 6,300 feet, must also be a record for the species. No other specimen was seen, and one can only wonder if this specimen had come from the hot valleys on the southern side of the Bernina range, and had succeeded in crossing that great mass of snow fields and glaciers. I have spent months collecting in the north-west side of the canton, but have never seen *daplidice*, nor did we subsequently, in our stay at Zernetz, see any sign of it. The next day was spent on the Languard Alp, which locality is quite useless for entomological purposes, owing to the number of cattle grazing there.

On July 11th we made an early start and went to the Tschierva glacier once more. The day was beautifully fine, and in spite of the early hour the number of insects about on the Alp Misaum, made it impossible to pass without putting up one's net, although one wished to hurry on and give all the time possible to the higher slopes. The first catch of the day was a beautiful ♀ *Melitaea cynthia*, and soon after *M. varia* and *M. aurinia* race *merope* began to appear everywhere. At last the foot of the final slopes was reached, and after several futile efforts to catch some fine *Erebia glacialis*, which were seen on the rocks below the path, I turned to the grassy side and secured a small *Erebia*, which proved to be *E. epiphron* var. *nelamus*. This gave me great hopes of coming on *flavofasciata*, for Mr. Fison took a "dark form" of *epiphron* at the same time as his two specimens of the former. In a very short time our boxes began to fill, *M. cynthia*, *M. varia*, and *M. aurinia* race *merope* were in absolute profusion, and it was, to me, a novel experience to find ♀s of *cynthia* in anything like numbers. Other species noted were, *Pieris brassicae*, *P. napi* race *bryoniae*, *Pontia callidice*, *Colias phicomone*, *Brenthis pales*, *Latiorina orbitulus*, *Lycæna arion* ab. *obscura*, *Coenonympha satyrion*, and in addition to the previously mentioned *Erebia*, *E. gorge* and *E. tyndarus*, the former being about in equal numbers, type and ab. *triopes*. Strangely enough, in such a prolific locality, no Hesperiidæ were present.

By midday we had covered every yard of those slopes, and made a very fine selection of specimens; but there was one notable blank. There were no *E. flavofasciata*. I was standing near the top of the slope, wondering for about the hundredth time where Mr. Fison's two specimens came from, when a specimen of *P. callidice* flew past me, and reaching the rocks a few yards above did not turn aside, but flew straight up, and in a moment or two disappeared over a ridge. My curiosity aroused, I was soon scrambling up over the expanse of rocks. Although somewhat resembling the chaos of rocks of the moraine below, these upper rocks were quite immovable, with small tufts of vegetation growing here and there between them. The distance was I found, considerably greater than it looked, for I had ascended almost 300 feet (by aneroid) before I got to the ridge. Above this I found another grassy slope, similar to the one below, some hundreds of yards long and rising about 200 feet to the face of the cliff behind. This slope, or rather these slopes, for the ground is much broken up by rock, are completely hemmed in by the belt of rocks which I had crossed, and invisible from below. The view was marvellous. The waved

surface of the glacier was, in itself, an amazing sight, and could be fully appreciated now lying 600 feet below one, while the ice falls (of which the glacier is but a part) seen from on a level, or perhaps one ought to say from less underneath, were a sight never to be forgotten.

Turning from this wonderful outlook, I felt that having got here I should just look around before going down again. The first thing seen was *E. epiphron* again; I had netted so many that morning in hopes they were *flavofasciata*, that I passed it without a second look. A few yards beyond two more rose from the grass at my feet, and I swept one up in passing; and, found the long sought *flavofasciata* in my net. After a second glance, to assure myself I was not mistaken, I lost no time in making after the two other specimens I had passed. Both were *flavofasciata*. Five minutes were enough to show I had indeed solved the puzzle of Mr. Fison's two specimens. The species was flying in numbers all over the slope, for the most part in very fair condition. It was considerably after lunch time, so I had to return to the lower slopes, where my wife had stayed painting, and in charge of our lunch. I found a somewhat easier way down, and after lunch we both climbed up again, when in about three-quarters of an hour, we took a really magnificent series of ♂s and four ♀s, two of the latter and fourteen ♂s falling to my wife's net; which I am sure is the first occasion on record of this species being captured by a lady.

That Mr. Fison's two specimens were wanderers from this colony there can be no doubt; but if there were, the following interesting point would soon dispel it. Mr. Wheeler notes, with reference to Mr. Fison's specimens (*Butts. of Switz.*, page 124), "the Tschierva glacier specimen has a slightly broken band, with very irregular inner edge." This peculiarity of the yellow band on the underside of the hindwings is exhibited by almost half of my specimens, and I have never seen it in a specimen from other localities.

This characteristic leads us to a question of some interest. Should this Tschierva race be known as the var. *thiemei*? I am not prepared to say, definitely, that it should not; as that name was given to the race of the Schafberg, and I have never seen any specimens from that locality. But, according to the description in Seitz, of *thiemei*, I see no reason for the existence of that name, and it certainly does not apply to my Tschierva specimens.

Eiffinger says the Pontresina race is distinguished from the type (Campolunga) race by being darker and having the band on the upper-side of the forewings broken into spots of varying size, the black centres of the spots being small and often obsolete, otherwise not much different from the type.

If this is all the difference shown by the Pontresina race, it certainly is not an adequate reason for maintaining that race as distinct from the type. It is extremely rare to see a specimen in which the rust-coloured band of the forewings is *not* broken into rings, and such a specimen could not, in the least, be said to be typical of the Campolunga race. If Eiffinger's description is correct, the only real difference between the type and *thiemei* is, that the size of the rings round the spots is reduced (though not always, for he states them to be of "varying size"), and the spots themselves are often obsolete. Both of these characteristics are common forms of variation in the type.

However, even if this Schafberg race shows no real distinction from

the type the Tschierva race does; and the final sentence of Eiffinger's description quite separates it from any connection with the name *thiemei*, for he says, "otherwise not much different from the type." Now, as already mentioned, the Tschierva race *does* differ from the type, and that to a very marked degree. This difference lies in the yellow band on the underside of the hindwing, the most conspicuous character of the insect. As Mr. Wheeler's note, already quoted, pointed out, this band was broken in Mr. Fison's specimen, and this peculiarity occurs in 50% of my specimens; but, in addition, in almost all my series, this band is so reduced in width that it often is only just wide enough to contain the black spots. Very often the last three of them are quite separated from the others, each surrounded by a narrow line of yellow. By the "last three" I mean those three spots nearest to the anal angle. This reduction in width is just as pronounced in the ♀ as in the ♂, and in one of my four ♀s the band has practically given place to six yellow rings, the three upper touching, and the three lower separate. The figure in Seitz (plate 36, row c, first figure), showing the underside of a ♀ *thiemei*, has the band as well developed as in any ♀ of the type race. This restriction of the band is so much more remarkable than the mere description would lead one to suppose, that I felt a photograph showing a series of the Tschierva specimens beside some of the type race, would be of interest.

Plate I. shows the characteristic features of the band very well, rows 1 and 2, Tschierva specimens, and row 3 some of my series of the Campolunga race. It would be very interesting if someone possessing a series of the Schafberg race, would tell us if they agree with the figure in Seitz (which might be the underside of a Campolunga specimen) or with my photograph of the Tschierva race. If the former is the case, then *thiemei* is practically a synonym of *flavofasciata*; and the Tschierva race undoubtedly deserves a racial name of its own. If the latter, then Eiffinger is at fault, and the Schafberg and Tschierva races must be united under the name *thiemei*.

One wonders during how many centuries has *flavofasciata* lived and had its being on that rock-bound slope, undisturbed by man; and how much longer it might have done so, but for the chance that brought Mr. Fison in the way of those two specimens, so many years ago; and the chance that led me to their retreat when I had given up the search.

How many such secrets do the peaks and valleys of the Alps conceal, and how often are we in close proximity and pass them by?

It was not until nearly seven p.m. that we reached Pontresina, tired, but greatly pleased by our success.

(To be concluded.)

### Notes on the Psychides.

By REV. C. R. N. BURROWS, F.E.S.

(Continued from page 62.)

I hold, in the material, which Dr. Chapman committed to my care, most of the actual specimens upon which these differentiations were based, and judge it to be important that I should, while I have them before me, place the facts upon record.\*

\* It is a matter of regret that Chapman mislaid, and could not find for me, his notes upon the Psychides. His specimens occasionally bear numbers—but these

I have made my measurements very carefully, at one sitting, and under precisely the same conditions.

The types of *Proutia eppingella*, Tutt (numbered 8752) (with four males and four cases in the Bankes Collection), and of *Masonia edwardsella*, Tutt, with four other males and two cases, are in the Walsingham Coll. in the British Museum, London.

The following specimens are at present with me:—

- Proutia eppingella*, Tutt, ? = *salicolella*, Brd., ? = *betulina*, Z., Spur-ratio, Chapman, '68.
- C.M. 73. "Prout's *Proutia*, June, 1900." A female, very imperfect.
- C.M. 74. "*salicolella*, Staud." Two wings.
- C.M. 75. "Prout's *salicolella*, 1899." Two legs.
- C.M. 76. "*P. salicolella*, Staudinger, 1899." Six legs.
- C.M. 77. "*salicolella*." A female (8752, in pencil) with pupal head cover. ? female type.
- Coll. 854. "Frankesreich. Fl." "*anicanella*, Brd., *salicolella*, Auct., nec. Brd." Two left-side wings. No body, legs, or antennae. Probably = nos. 74 and 76 above.

The absence of the bodies from Chapman's specimens makes it impossible to identify them from the genitalia.

The tibial spur ratios of the foregoing specimens are as follows:—

C.M. 75. "Prout's <i>salicolella</i> , 1899." ... ..	66
C.M. 76A. " <i>P. salicolella</i> , Staud., 1899." ... ..	62
C.M. 76B. " <i>P. salicolella</i> , Staud., 1899." ... ..	63
C.I. F.A. "Abbé de Joannis, <i>P. salicolella</i> ." ... ..	76
C.I. F.B. "Abbé de Joannis, <i>P. salicolella</i> ." ... ..	78

A.B. signify two separate legs.

Compared with this we have:—

<i>Proutia betulina</i> , Z. Spur-ratio, Chapman, '69.	
Coll. 1116. Dr. Zerny, "Habich Wien," 30.vi.82 ... ..	62
Coll. 852. Chapman, " <i>P. betulina</i> ," no loc. ... ..	62
Coll. 963. Chapman, " <i>P. betulina</i> " ... ..	60
Coll. 1097. Dr. Zerny, "Prater, 19.vi.90" ... ..	61
Coll. 1057. Staud., "Lausn. Trans." ... ..	65
Coll. D. de Joannis, "Italia cent. Latium, S.E." ... ..	73
Coll. E. de Joannis, no loc. ... ..	61

The evidence of the tibial spur, in favour of two species, would appear to be very weak.

*Masonia edwardsella*, Tutt. Spur-ratio, Chapman, '71.

C.M. 83A. Two heads, one with antennae and front legs.	
" <i>edwardsella</i> , Aix les Bains" ... ..	72
C.M. 83B. Ditto ditto ditto ... ..	71
C.M. 84. Two front legs, " <i>edwardsella</i> " ... ..	65

Two heads are missing from specimens in the Walsingham Collection. No specimens are discoverable in the Chapman Collection.

numbers are not consecutive and are very few in comparison with the total number of insects dealt with. Moreover, in some instances the numbers are repeated, which renders their use very difficult, and in several cases they do not agree with the corresponding material.

	<i>Masonia mitfordella</i> , Chapm. Spur-ratio, Chapman, '70.			
C.M.	88.	Mitford's black pin, Mason Coll., " <i>mitfordella</i> ."		
		One front leg ... ..		·76
C.M.	89.	" <i>nitidella</i> , Mason Coll., '77, <i>mitfordella</i> ."	One	
		front leg ... ..		·73
C.M.	171.	" <i>Fumea</i> , Mitford, Clark Coll."	One front leg ...	·70
Coll.	970.	"Clark Coll." Four wings, no body, antennae,		
		or legs.		
Coll.	970.	Ditto ditto ditto.	One hind leg.	
	<i>Masonia hibernicella</i> , Chapm. Spur-ratio, Chapman, '67.			
Coll.	114.	"Glengariffe. 19. Joints, last good, spur $\frac{1}{4}$ "		·77
Coll.	1173A.	"Glengariffe, McArthur"	... ..	·77
Coll.	1173B.	Ditto ditto	... ..	·76
	<i>Fumea scotica</i> , Chapm. Spur-ratio, Chapman, '78-'81.			
C.M.	116.	"Large <i>Fumea</i> , Rannoch, <i>scotica</i> ."	One front leg	·80
C.M.	117.	"Large Sutherland <i>Fumea scotica</i> "	... ..	·80
Coll.	1119.	"Inveran, F. G. Whittle"	... ..	·78
	<i>Fumea bowerella</i> , Chapm. Spur-ratio, Chapman, '77.			
C.M.	155A.	"Bower. 17." Head and legs	... ..	·77
C.M.	155B.	Ditto ditto	... ..	·80
	<i>Fumea germanica</i> , Chapm. Spur ratio, '88.			
Coll.	864.	One male, four wings, no body, head, or legs.		
C.M.	112A.	"Voelschew (152), <i>affinis</i> ."	Head and legs ...	·85
C.M.	112B.	Ditto ditto	... ..	·81
C.M.	113.	"Voelschew (148), <i>affinis</i> ."	Head and legs ...	·83
C.I.	9.	A male, no data	... ..	·85

There remains *Bankesia douglasii*, Sta., the unique specimen of which is in the Bankes Coll. in the British Museum. Until this insect can be duplicated, or the type drastically examined, it is useless to add to the conjectures which have already been formed about it.

The extremely fine measurement applied in this investigation is quite unused, as far as my information goes, in any other group of the Lepidoptera. Evidently, unless every individual in a species is an exact replica of the remainder, the possibility of endless division would be enormously increased. No such examination has, I believe, ever been made of a sufficiently large number of specimens to enable us to judge what amount of difference may occur in size, as well as formation, in a single species. I do not agree with the old collector who is credited with saying that "unless he could see it across a five-barred gate, he did not reckon it a 'var.'!" but I do maintain that it is a pity to establish species upon an insufficient, and unproved basis. I would not be credited with saying that these species are not, or cannot be, proved to be valid, but rather that until we have sufficient material of each, the question must remain in abeyance.

Of the 315 specimens consisting of Chapman's mixed material, augmented by my own additions—

20 measuring between ·51 and ·64 are Bruandias.

59 measuring between ·61 and ·71 are called Masonias.

286 measuring between ·72 and ·82 are called Fumeas.

I am able to separate Bruandias by the genitalia, but I cannot separate Masonias from Fumeas except by size. With a few anomalies

and gaps, the figures from .51 to .82 form a continuous series. It is therefore possible that a difference in the measurements of .01 mm. may not only shift a specimen from one species to another, but may even shift it into a different genus, since no line of absolute demarkation is anywhere discoverable. These anterior tibial spurs are not confined to the species here considered, but occur in other genera, and groups of species, the ratio numbers often running parallel with these.

At the risk of exhausting the patience of my readers, I venture to include the result of our investigations of this curious and complicated subject. I have prepared two tables in which are recorded the particulars of these very exhaustive examinations. The first represents the measurements of several hundred specimens of the mixed species allied to *Fumea*, the second a similar examination of *Bijugis* and *Psychidea*. These measurements cannot be accepted as absolutely correct, within probably .02mm., owing to the difficulties which I have pointed out.

Table of Tibial spur ratios in *Bruandia*, *Masonia*, and *Fumea*.

Ratio.	Number.		
.51*	1		
.53*	(1009S)		
.54*	2		
.55*	1		
.56*	2 (733C) (1188T)	<i>B. reticulatella</i>	.56, Tutt, p. 303.
.58*	1		
.60*	3		
.61†	(1098Z)	<i>B. comitella</i>	.61-.62, Tutt, p. 304.
.62†	1		
.63†	2	<i>B. comitella</i> (*734C)	(†1189T)
.64	2?	Limit of <i>Bruandia</i>	.64, Tutt, p. 299. <i>B. comitella</i> C. <i>M. subflavella</i> J.
.65	2		
.66	1		<i>M. crassiorella</i> .66-.70, Tutt, p. 307.
.67	8		<i>M. hibernicella</i> .67.
.68	7 (744C) (1190T)		<i>M. subflavella</i> , J.
.69	3		
.70	23 (736C)	<i>M. crassiorella</i>	<i>M. mitfordella</i> , <i>M. affinis</i> , <i>M. subflavella</i> .70.
.71	13	Limit of <i>Masonia</i> .71,	<i>M. edwardsella</i> . Tutt, p. 299.
.72	16		
.73	11		
.74	10		
.75	17		
.76	13 (738C)	<i>M. crassiorella</i> .	
.77	16	Mucking & Glengariff. Lowest for <i>F. casta</i> ,	<i>F. bowerella</i> , } .77, Tutt, p. 314. } .77-.80. }
.78	14 (1119W).		<i>F. scotica</i> , .78-.81.
.79	14		
.80	91		
.81	25	Limit of <i>Fumea</i> , .81,	Tutt, p. 299.

·82	24
·83	3?
·84	1
·85	2?
·88	

*F. germanica*, ·88, Tutt, p. 299.

\* = Boss on tegumen = *Bruandia*. † = No boss on tegumen.  
Nos. in brackets = separate mounts.

Tibial Measurements in *Psychidea* and *Bijugis*.

*Psychidea* = Short spur = *Fumea* form:

·83	C.	743	<i>B. graecella</i> .		
·39	T.	18	<i>P. majorella</i> :		
·41	T.	1145	<i>P. suriens</i>	T. 1150	<i>P. marjorella</i> .
·42	S.	860	<i>P. nudella</i> .		
·43	T.	16	<i>P. sapho</i> .	S. 1040	<i>P. marjorella</i> .
·44	S.	1039	<i>P. marjorella</i> .		
·45	S.	958	<i>P. sapho</i> .	S. 868	<i>P. nudella</i> .
				Z. 1099	<i>P. nudella</i> .
				Z. 1100	<i>P. plumella</i> .
				T. 6	<i>P. sapho</i> .
·48	T.	2	<i>P. suriens</i> .	C.M. 187	<i>P. sapho</i> :
·49	T.	1147	<i>P. sapho</i> .		
·50	C.	866	<i>P. nudella</i> .	T. 1144	<i>P. suriens</i> :
				S. 966	<i>P. plumella</i> .
				S. 1011	<i>P. nocturnella</i> .
				S. 1059	<i>P. plumella</i> .
·51	T.	1148	<i>P. sapho</i> .	C. 864	<i>P. suriens</i> .
				S. 1233	<i>P. nocturnella</i> .

*Bijugis* = long spur = *Epichnopteryx* form.

·52	S.	1010	<i>B. bombycella</i> :	C. 1202	<i>B. "Lauterets."</i>
·53	C.	949	<i>B. bombycella</i> :	S. 1192	<i>B. bombycella</i> .
·54	T.	1141	<i>B. bombycella</i> :	T. 4	<i>B. bombycella</i> .
				S. 950	<i>B. pectinella</i> .
·55	C.	956	<i>B. bombycella</i> :	C. 741	<i>B. proxima</i> .
				C.M. 185 <sup>1</sup>	<i>B. bombycella</i> .
				C.M. 186	<i>B. bombycella</i> .
				T. 3	<i>B. pectinella</i> .
·56	S.	1193	<i>B. bombycella</i> :	T. 1140	<i>B. bombycella</i> .
·57	T.	1142	<i>B. bombycella</i> :	T. 1143	<i>B. bombycella</i> .
				C. 863	<i>B. proxima</i> .
				S. 1191	<i>B. proxima</i> .
·58	C.M.	185 <sup>2</sup>	<i>B. proxima</i> .		
·59	C.	867	<i>B. pectinella</i> :	S. 1231	<i>B. pectinella</i> .
·60	S.	1232	<i>B. pectinella</i> .		
·62	C.	865	<i>B. pectinella</i> :		
·64	C.M.	185 <sup>3</sup>	<i>B. pectinella</i> :	C. 957	<i>B. bombycella</i> .

S. = purchased. C. & Coll. = Chapman Coll. T. = Turati. Z. = Zerny.  
W. = F. G. Whittle. J. = Abbè J. de Joannis. C.M. = Chapman's Mounts.

It will be noticed that \**B. graecella* ·83 is the only specimen which

\* In spite of its low spur-ratio this insect agrees with *Bijugis* rather than *Psychidea*. It has indeed a short spur, but the formation of the genitalia approaches *Epichnopteryx*, as does *Bijugis*. The connection with *Psychidea*, which has the *Fumea* form, is not close. Quite possibly the insect will require to be placed in a new genus.

falls out of its place. The names here are almost entirely those under which I received the specimens, only corrected when evidently wrong. There would appear to be much confusion about *Psychidea nudella*, which would seem to be a rare species, and, difficult to recognise. This is unfortunate, as Rambur's genus *Psychidea* is based upon its "short spur." I have one specimen from Chapman and one or two more which have come to me under different names, but several which I have received under this name are not *nudella*, for they have no tibial spur. Further, these spurless species, which cannot be included in *Psychidea* or *Bijugis* on this account, or in *Fumea*, *Masonia*, or *Bruandia* for the same reason, seem to separate into several species, which all appear to bear the name of *vestalis*, Staud.!

(To be continued.)

## NOTES ON COLLECTING, etc.

WARWICKSHIRE RECORDS OF ICHNEUMONIDAE (Continued).—OPHIONINAE.—*Campoplex rugifer*, Fst.—Bretford, 2.vi.1918, rare. *C. falcator*, Fab.—Bubbenhall, 10.viii.18, H. G. Wagstaff (host *Cosmotriche potatoria*). *C. angustatus*, Th.—Kenilworth, 8.viii.20. *C. terebrator*, Fst.—Bubbenhall, 1.viii.19, H. Cooke; Brandon, 11.vi.19; Stoke, 28.v.20; Corley, 29.v.20; Coombe, 9.v.20, common and generally distributed. *C. nitidulator*, Hlgr.—Stoke, 20.v.19; Coombe, 20.v.1916; Corley, v.17; Hawkesbury, 9.vi.17. *C. myrtilus*, Desv.—Ryton, 6.vi.20; Corley, 29.v.20, rare. *C. cultivator*, Gr.—Coventry, ♀, 1915. *C. pugillator*, Linn.—Bubbenhall, 2.vi.18, H. G. Wagstaff. *C. monozonus*, Fst.—Stoke, viii.16. *Sagaritis holmgreni*, Tsch.—Brandon, 4.ix.21. *S. latrator*, Gr.—Brandon, 21.ix.19. *S. annulata*, Gr.—Binley, 2.x.21. *Casinaria vidua*, Gr.—Coventry, 7.vii.21, F. Pepper. *C. moesta*, Gr.—Kenilworth, 1918; Ryton, 1.vii.19. *Nemeritis cremastoides*, Hlgr.—Stoke, 22.v.21, ♀♀. *Spudastica kreichbaumeri*, Bdg.—Tile Hill (host *Lygaeonematus compressicornis*), 25.iv.20, 25.iv.20, 28.iv.20, rare. *Omorga faunus*, Hlgr.—Generally distributed. *O. molesta*, Gr.—Stoke, June, 1916, 1919. *O. borealis*, Ztt.—Stoke, 1919. *O. ensator*, Gr.—Stoke, viii.16. *Meloboris inculcator*, Gr.—Stoke, 28.viii.20. *M. crassicornis*, Gr.—Bubbenhall, 22.vi.19; Brinklow, 2.viii.20. *Angitia majalis*, Gr.—Coombe, 15.viii.20; Stoke, 1.ix.20 (host *Depressaria heracleana*). *A. chrysocticta*, Gr.—Ryton, 6.vi.20. *A. curvicauda*, Hlgr.—Bubbenhall, v.18; Kenilworth, 1918. *Anilasta ruficincta*, Gr.—Stoke, 4.vii.20. *Labrorynchus clandestinus*, Gr.—Ryton, 10.vii.21, ♀♀; Stoke, 20.vii.21. *L. tenuicornis*, Gr.—Common and generally distributed. *Agyrpon flaveolatum*, Gr.—Bubbenhall, 8.vi.18; 29.vi.19; Bubbenhall, 1.vi.19; 9.vi.19, H. Cooke. *Ophion luteus*, Linn.—Stoke, 1918; Coventry, 1916; Aldridge; Coventry, 20, F. Shotten. *O. distans*, Th.—Bubbenhall, 10.viii.18. *O. stigmaticus*, Morl.—Bubbenhall, 18.v.21. *O. scutellaris*, Th.—Generally distributed. *O. obscurus*, Fab.—Stoke, 29.ix.19, E. H. Sills. *O. ventricosus*, Gr.—Bubbenhall, 9.vi.18; 18.v.19; 7.vi.19; Bubbenhall, 18.v.19; 15.vi.19, H. Cooke, rare. *Paniscus cristatus*, Th.—Stoke, June, September, 1916; Canley, 29.viii.1919, Cooke. *P. melanurus*, Th.—Coventry, 5.vi.19; Stockton, 28.viii.20; Wolvey, 3.vii.21. *P. testaceus*, Gr.—Coventry, 1915; Stoke, 1918; Brandon, 6.ix.17; (host *Acronicta abni*). *P. gracilipes*, Th.—Stoke, viii.16;

Waverley Wood, 9.viii.17; Hunningham, 6.viii.17; Ryton, 30.ix.17; Stoke, 21.vi.18. *Astiphrommus alarius*, Gr.—Bubbenhall, 22.vi.19, H. Cooke. *Mesochorus politus*, Gr.—Stoke, 15.v.20. *M. confusus*, Hlgr.—Princethorpe, 26.vii.19; Stoke, 1919. *M. vittator*, Hlgr.—Stoke, ix.16. (To be continued.)—J. W. SAUNT, 53, Enfield Road, Stoke, Coventry.

## SOCIETIES.

### THE ENTOMOLOGICAL SOCIETY OF LONDON.

March 7th, 1923.—The President announced that Dr. G. A. K. Marshall, C.M.G., had been selected for election as a Fellow of the Royal Society, and a vote of congratulation was passed to him, with acclamation.

ELECTION OF FELLOWS.—Mr. A. M. Stewart, 38, Ferguslie, Paisley, Renfrewshire, Scotland; Mr. F. G. S. Whitfield, 25, Drayton Gardens, S. Kensington, S.W; Mr. A. J. C. Wightman, "Aurago," W. Chilington Common, Pulborough, Sussex, were elected.

EXHIBITIONS.—Mr. G. Talbot exhibited on behalf of Mr. J. J. Joicey a number of gynandromorphs of Lepidoptera, from various parts of the world.

Major H. C. Gunton exhibited a remarkable variety of *Grammesia trilinea* from Gerrard's Cross, Bucks.

Professor E. B. Poulton, F.R.S., produced further evidence that the wings of Lepidoptera are sometimes nibbled by caterpillars. He also exhibited and made remarks upon some fragments of beetles from a Pleistocene peat-bed at Wolvercote, nr. Oxford. These specimens gave rise to considerable discussion.

Mr. J. H. Durrant exhibited an example of *Hieroxestis sanctaehelenae* taken in a house at Margate and suggested that it might have been introduced *via* the Canaries in bananas.

Dr. Malcolm Burr referred to the necessitous circumstances of A. P. Semenoff Thian-Shanski, an Honorary Fellow of the Society in Petrograd, and said that remittances could be sent to him through the American Relief Fund. A proposal by Mr. J. H. Durrant, seconded by Mr. J. E. Collin, that the Society should head the list of subscribers with a donation of 20 dollars was passed unanimously. Mr. A. Dicksee kindly undertook to collect and transmit the remittances to this Fund.

PAPERS.—The following papers were read:—(1) "On a Lepidopterous Scavenger living in Parrots' Nests," by Dr. A. Jefferis Turner. (2) "On the mouth parts of the Micropterygoidea," by Dr. R. J. Tillyard.

March 21st, 1923.—ELECTION OF FELLOWS.—The following were elected:—Messrs. A. E. J. Carter, "The Retreat," Monifieth, Nr. Dundee; L. G. Cox, 90, Marine Parade, Worthing; F. C. Garret, West Croft, Hexham; G. Handley, 54, All Saints Road, King's Heath, Birmingham; H. Notman, F.S.A., 136, Joralemon Street, Brooklyn, New York; D. A. Owen, 94, Wellington Street, Luton, Beds; L. G. Saunders, B.Sc., Molten Institute, Cambridge; E. G. R. Waters, M.A., 40, Leckford Road, Oxford; E. J. Winstanley, L.D.S., R.C.S., 25, Fellows Road, Hampstead, London, N.W.

RUSSIAN ENTOMOLOGISTS.—Mr. A. Dicksee reported on the Fund

initiated at the last Meeting for Professor A. P. Semenoff Thian-Shanski, and a Committee consisting of Dr. Burr, Mr. Dicksee and Mr. Uvarov was appointed to consider the rendering of assistance to other members of the Russian Entomological Society.

EXHIBITIONS.—Dr. S. A. Neave exhibited, on behalf of Sir Gilbert Carter, a number of butterflies collected by him in the Canaries, and read some notes on them prepared by Mr. N. D. Riley.

Mr. G. Talbot exhibited, on behalf of Mr. J. J. Joicey, some African butterflies, including the hitherto unknown female of *Alaena aurantiaca*.

Mr. H. E. Andrewes exhibited examples of *Carabidae* from the Oriental and Australian regions.

Professor E. B. Poulton, F.R.S., exhibited a series of *Rumicia phlaeas* race *pseudo-phlaeas* from Abyssinia, and also a Satyrine butterfly of strong Palaearctic affinities, from Somaliland.

PAPERS.—The following papers were read:—(1) "A contribution to our knowledge of the Orthoptera of Macedonia," by Dr. M. Burr and others. (2) "On the homology between the genitalia of some species of Diptera and those of *Merope tuber*," by Mr. F. Muir. (3) "Records and problems of Insect Migration," by Mr. C. B. Williams.

#### THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

February 8th, 1923.—Mr. Fawthorpe was elected a member.

Mr. Frohawk exhibited a coloured drawing of *Pyrameis cardui* in a setting of flowers and leaves, and a drawing made by a ship's officer, of a flying-fish which struck him on the face while on deck.

Mr. A. E. Tonge, a series of *Colias croceus (edusa)* bred in November last from ova laid in September. There was little variation shown, only one example, a male, had a paler ground.

Mr. A. A. W. Buckstone, series of normal *Epirrita (Oporabia) autumnaria* and *E. filigrammaria*, a series of hybrids of the two species, the results of two pairings of the hybrids, and the further results of two pairings of these last. The hybrids were mostly intermediate, but the specimens, the result of the last pairings, closely resembled *autumnaria*.

Mr. A. W. Mera, series of *F. (O.) christyi* from Chalfont Road, and of a melanic race of *F. (O.) autumnaria* from Middlesbrough, and remarked that they were very closely allied species.

Capt. Crocker, a long series of *Coenonympha pamphilus* illustrating the range of variation in ground-colour, spotting, marginal markings, suffusion, etc.

Mr. K. G. Blair, two forms of *Anaitis plagiata*, which Dr. Jordan has just shown were morphologically two species. Nothing was yet known of the larval differentiation.

Mr. Cheesman, a beetle disclosed on cutting timber from Riga.

Mr. A. W. Andrews, flower-heads of an Umbellifer with numerous Anthomyid flies entrapped by their proboscis.

Mr. S. Blenkarn, species of local and rare Coleoptera including *Lycoperdina succincta* from Mildenhall, *Staphylinus pedator* from Box Hill, *Rhagonycha unicolor (translucida)* from Box Hill, *Sphodrus leucophthalmus* from a corn-shop in Woolwich, *Anchomenus 4-punctatus* from Cawthorne, etc.

The Hon. J. Waterston read a paper entitled the "Natural History of St. Kilda," with lantern illustrations.

February 22nd, 1923.—Mr. L. W. Newman exhibited series of *Charaëa graminis*, from heavily marked to almost devoid of markings, *Noctua depuncta* var. *maddisoni*, a red *Dianthoëcia carpophaga*, 2 ♀ *N. subrosea*, and a *Chrysophanus dispar* all from the "Horne" collection.

Mr. Grosvenor, some *Zygaena stoechadis* which were a transition to *Z. filipendulae*.

Mr. A. A. W. Buckstone, a series of *Anaitis plagiata* and pointed out the newly differentiated species *A. efformata* among them.

Mr. Enefer, a very large centipede and a large cockroach found in some cases of pineapples from Singapore, unloaded at a Bermondsey wharf.

Mr. Blenkarn, the local beetle *Lebia chlorocephala* from Otford, Kent.

The rest of the exhibits were lantern slides shown by Messrs. Main, Frisby, Dennis, Bunnett and Dods.

March 8th, 1923.—The President in the chair.

Mr. A. A. W. Buckstone gave a box of British Lepidoptera to the Society's Reference Collection.

Mr. R. Adkin exhibited the following aberrations of Palaearctic Rhopalocera, which had been artificially produced.—*Pyrameis atalanta*, with red band almost obsolete; *Vanessa io*, with ocelli obliterated; *Aglais urticae*, with large unicolorous blackish-brown area; *Eugonia polychloros*, with smeared blotches on forewings; *Apatura iris*, with white bands nearly obsolete; *Melanargia galathea*, *Dryas paphia*, etc., and others of each species

Mr. H. Moore, *Anosia archippus*, taken 100 miles off the coast of S. America; cases of the large "bag-worm" (Psychidae) *Oeceticus omnivorus* from N. Island, New Zealand, and referred to its dipterous parasite *Eurigaster marginatus* and the hyper-parasite, *Pteromalus* sp.; and the giant cricket "Weda," *Hemideina megacephala* of New Zealand, with notes on its depredations and habits.

Mr. Hare, a probably unique aberration of *Anaitis plagiata*, a wide-banded form from Erith, and a markingless example of *Leptostia sinapis* from Symons Yat.

Mr. O. R. Goodman, a series of *Thymelicus acteon* from the Isle of Purbeck with a series from S. France and pointed out that the males of the latter had both the stigma of the ♂s and the crescentic line of the ♀s of the former series.

Mr. F. W. Frobawk, British *Aporia crataegi* with supernumerary veins developed in the hindwings, others with discoidal spots on the hindwings, and others with dark hind-marginal shading.

Capt. Crocker, a curious aberration of *Polyommatus icarus* with all the usual markings obsolescent and the ground colour of a light brown uniformly.

Dr. Fremlin read a paper entitled, "The Growing Importance of Entomology," and there was a short discussion.

## REVIEWS AND NOTICES OF BOOKS.

RESPONSES OF THE LARGE WATER-STRIDER, *GERRIS REMIGIS*, SAY, TO CONTACT AND LIGHT.—By C. F. Curtis Riley, Department of Zoology, University of Manitoba, Winnipeg, Manitoba, Canada. 58 pp. reprinted from *Annals of the Entomological Society of America*. Columbus, Ohio, December, 1921.—This is another contribution to the already extensive literature dealing with the American Water-Bugs. The hydrobiotic insect fauna of the Nearctic Province is extensive, the material is abundant, the biological problems are numerous and interesting, the entomologists are keen, and the dollars are forthcoming: so it is not to be wondered at that the results are commensurate. In this paper, Mr. Curtis Riley almost confines his attention to one species, *Gerris remigis*, Say, one of the largest American Gerrids, about the size of our *G. najas*, L., and the subjects dealt with are those to which the names "thigmotaxis" and "phototaxis" have been given, *i.e.*, the responses made by the insects to the stimuli of contact and light; or, to put it in plain English, just how the bugs behave when they come in contact with solid bodies, wavelets, rain-drops, puffs of air, etc., and when exposed to the influence of light, both sunshine and electric, the latter being either stationary or in motion. The methods adopted were those of careful observations in the field, and laboratory experiments. Under the heading of the "thigmotactic response," the most interesting phenomena dealt with are those of hibernation, death-feigning, and clustering. Evidence is given that the Gerrids hibernate amongst dead leaves, under bark, and in the cracks of logs, and similar places usually quite near their pond. When one reads of beds of dead leaves measuring  $8 \times 4 \times 3$  feet on the margins of pools, and of finding 250 specimens of the bugs in such quarters, one can hardly help envying the Hemipterists of the New World their ideal opportunities; but a corrective is administered by the author's confession "It was a long time before I found *Gerris remigis* in a hibernating condition. Search was made in almost every conceivable situation before the hibernation quarters of the species were located." He adds also, "I never have found them hibernating in mud, in water, at the bottom of water, at the bottom of a pool, pond, brook, creek, or river." Death-feigning results apparently from the sense of touch and not from that of sight. In the phenomenon of "clustering" we seem to meet with a certain degree of individuality in the members of the group; certain of them become, after a time, restless, and in their struggles to free themselves from the contact of their comrades, whose legs and bodies frequently overlap them, they tend to disintegrate the group. This restlessness is explained as possibly due to some internal physiological (or might it even be psychological?) differences in the individuals. In the experiments with light it was found that the insects moved towards the source of light and oriented with their faces thitherward. This produced some puzzlement when the light oscillated. On the whole we may say that these 58 pages, well printed and free from typographical errors, are eminently stimulating and suggestive, and should be useful to English students as indicating methods of procedure and subjects for investigation. Numerous photographs enable the reader to realise to the full the nature of the habitats of *Gerris remigis*, Say.—E. A. BUTLER (F.E.S.), 35, Kyrle Road, West Side, Clapham Common, S.W. 11.

**Subscriptions for Vol. XXXV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1923.]**

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*Duplicates*.—*Sybilla*, *Paphia*, *Io* (2), *Selene*, *Lucina* (2), *Ocellatus*, *Illustraria* (autumn) *Nastata*, *Roboraria* ♂, *Prunaria* (4) ♂, *Tipuliformis*. *Desiderata*.—*Castreusis* ♂, *Cucullina*, *Cribrum*, *Cinerea*, *Ravida*, *Ashworthii*, *Notata*, *Obfuscaria*, *Smaragdaria* and others, also vars. and local forms.—*Harold E. Winser, Kent House, Cranleigh.*

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## MEETINGS OF SOCIETIES.

**Entomological Society of London.**—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. June 6th; October 3rd, 17th.

**The South London Entomological and Natural History Society**, *Hibernia Chambers*, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. May 24th, "Some Ancient Naturalists and their Work," R. Adkin, F.E.S.—*Hon. Sec.*, Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

**The London Natural History Society** (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C.2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

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## Preliminary Observations on the British Vanessids.

By HAROLD B. WILLIAMS, LL.B., F.E.S.

(A Paper read before the London Natural History Society, April 17th, 1923.)

The title of this paper requires a few words of explanation. I have felt for some time that a collation of the published information on the British members of the Vanessid group would be a useful contribution to entomological knowledge. Pending the completion of the necessary research work, for which at present I have very little time, I think I may usefully present to your notice a few facts concerning the group, together with some preliminary, and to some extent non-committal, observations of my own, in the hope of stimulating discussion and research which may be helpful later.

The Vanessid species usually included in the British list are seven in number:—*Polygonia c-album*, *Eugonia polychloros*, *Aglais urticae*, *Vanessa io*, *Euvanessa antiopa*, *Pyrameis atalanta*, *Pyrameis cardui*.

These species occur throughout Europe. The three latter (*antiopa*, *atalanta* and *cardui*) occur in palaeartic America, where also the three first mentioned are represented by closely allied forms.

*Pyrameis huntera*, occasionally recorded from Britain, is also a North-American species. In my opinion it is as much a "British species" as *P. cardui*. That is to say neither species, I think, is a constant resident. *P. cardui* is a regular immigrant, *P. huntera*, at present, a very rare one, but it would be rash to doubt the possibility of its becoming as frequent a visitor as *P. cardui* in the future.

Other species have been recorded. *Aglais milberti*, the common American nettle tortoiseshell and a close ally of *A. urticae*, was once exhibited at a London Society as a variety of the latter species, and alleged to have been taken in Sussex. Possibly it may have been so taken, but at the time in question it seems to have been rather a habit of certain dealers to palm off on unsuspecting amateurs foreign examples of closely related species as aberrations of British species. I hope, however, when circumstances permit, to experiment with *A. milberti* with a view to ascertaining whether it will breed in this country. I see no reason why it should not do so, indeed I think it is extremely probable that it will, unless exterminated in the early stages of the experiment by eager collectors, or by some self-appointed executioner who fears an extension of the limited number of species included in that sacrosanct compilation "THE BRITISH LIST," a name, which I have written in capitals, in deference to the exaggerated reverence with which the insular mind of the ultra-conservative is apt to regard it.

This little explosion has reference not only to the fate I anticipate for *A. milberti*, but also to the fate which I am informed on good authority has overtaken the interesting little species *Vanessa prorsa*, which seemed well able to establish itself in this country. I do not propose to refer further in this paper to *Aglais milberti* as a possible denizen of this country, though it may be necessary to mention the species in considering the variation of *A. urticae*.

The problems suggested by a superficial examination of the British Vanessids are too numerous to be dealt with, even briefly, within the limits of this paper. I propose therefore to confine myself here to two

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branches of the subject, a detail in metamorphosis and a particular aspect of variation, both of which I shall submit to you in the guise of preliminary observation, indicating my views under cover of those words beloved of lawyers—"Without Prejudice." I am entirely open to conviction and eager for criticism. I trust, moreover, that I may be able to interest you sufficiently to encourage observation and record in the ensuing season, so that it may be possible to speak with more conviction at a later date. The two points, upon which I propose to address you, are the act of pupation, and the parallel and convergent variation of *Aglais urticae* and *Vanessa io*. Before passing to these subjects, however, may I briefly indicate one or two other matters affecting the group upon which I should like further information. In the first place the hibernation in this country of the two species of *Pyrameis* cannot, I think, be yet regarded as fully understood. You are all, of course, aware of the careful experiments of Mr. L. W. Newman of Bexley, but more facts are desirable before any satisfactory conclusion can be drawn. I am particularly anxious to know what, if any, reliable records exist of either species being seen on the wing in the winter months, or of either of them being disturbed or observed in natural hibernation. Records relating to *Aglais urticae* and *Vanessa io* are frequent. I know of one relating to *Ewanessa antiopa*. I have three relating to *Pyrameis atalanta*. I know of none for *P. cardui*, *Polygonia c-album*, or *Eugonia polychloros*, though the two latter undoubtedly hibernate here.

In the second place I should like a definite and detailed observation as to the pupation of *Vanessa io* in nature. This species does not normally pupate on the nettle stems, as *Aglais urticae* so often does. Where does it go to?

In the third place I should like to know of any records of the capture (not breeding) of *Vanessa io* ab. *fischeri*, Stndf., in this country. I am satisfied that this aberration ought to occur wild here, particularly in its more northern localities.

To return to the specific questions I want to put. The first concerns the pupation. For the purposes of this paper and without committing myself in any way to an assertion that it is so, I shall assume that all Lepidoptera, or at any rate all Rhopalocera, which suspend themselves by means of the cremaster in the pupal state, achieve that position by the same process. It may very well be that this assumption is unwarranted and I only make use of it at this stage for convenience, as in the present state of knowledge it is impossible to collate sufficient observations on individual species for the purpose of comparison.

Let me first state the problem. It is this: How does the pupa withdraw itself from the larval skin and attach itself by its cremastral hooks to the same pad of silk which supported the larva? Let me preface my rough notes by saying that more rubbish has been written on the subject than on almost any other entomological problem, notwithstanding the existence of certain very careful and precise observations.

As an instance of early writings I may refer to Buckler's well-known account of the pupation of *Limenitis sibilla*, in vol. 38 of the *E.M.M.*, which is reprinted in Newman, p. 69.

"In the course of the third day the creature seems to wake

up, unbends its head, swings itself to and fro a few times, then stretches itself downwards in a long attenuated line, which causes a rupture of the skin close to the head, which is seen slowly to ascend, exposing the bare and soft shining parts below from which a flat and forked pair of horns grow out perceptibly as one beholds this wonderful process; the skin continues to glide slowly upwards, and as the soft parts become exposed they are seen to swell out laterally and assume the very singular projections of the chrysalis; the skin of the old head gliding up the belly marks the progress of the disclosure, as the colours of the old and new surfaces are at this time alike, but the new rather more shining and semi-transparent; occasionally, during the bulging out of the soft parts, a kind of convulsive heave or two occurs, but otherwise it remains still until the creature is uncovered as far as the ninth or tenth segment; it then curves its anal extremity by a sudden twist laterally, and in a moment dexterously withdraws the tip of the anal segment from the claspers by an opening in the back of the skin at that part; at this critical moment one has time to see that the naked, shining point is furnished with black hooks, and to expect its fall, but in another moment it has forcibly pressed the curved tip with its hooks against the stem, close to its previous attachment of the anal claspers, which has proved strong enough for the occasion."

Buckler's suggestion that the cremaster is passed through a special opening in the larval skin, I have not met with elsewhere, nor is it in accordance with the facts, unless *L. sibilla* is unique in this respect. For the remainder, this description is typical of many in its suggestion that the safe attachment of the pupa is due to the speed with which the cremaster is withdrawn and forced to its point of attachment. In actual fact this is a most deliberate movement, and in my opinion any "sudden twist laterally" would probably be fatal. Buckler's account, like many others, resembles the traditional schoolboys' prescription for making a vacuum—"Fill a flask with water, turn it upside down to let the water out and put the cork in quick."

Parallel with this one finds another hypothesis, to my mind equally absurd, but which has obtained some acceptance and has even been regarded as to some extent within the limits of possibility by no less an authority than Scudder. This "explanation" may be given in the words of Martin Duncan's English edition of Figuiet's *Insect World* (1872) though it appears to be based on an "observation" of Réaumur and was published in Kirby and Spence, vol. iii., pp. 208-209.

"But here comes the culminating point, the most difficult part of the operation. The chrysalis, which is shorter than the caterpillar, is at some distance from the silky net work to which it must fix itself; it is only supported by that extremity of the caterpillar's skin which has not been split open. It has neither legs nor arms, and yet it must free itself from this remaining part of the skin and reach the threads to which it is to suspend itself. *The supple and contractile segments of the chrysalis serve for the limbs which are wanting to it. Between two of these segments as with a pair of pincers, the insect seizes a portion of the folded skin and with such a firm hold that it is able to support the whole of its body on it.* It now curves the hinder parts slightly, and draws its tail entirely

out of the sheath in which it was enclosed, etc." (Pupation of *Aglais urticae*.)

It is difficult to understand how this gymnastic feat can ever have been supposed possible. Osborne pointed out (*E.M.M.*, XV. 61) that the newly excluded pupa is in an utterly soft condition, that the caterpillar skin is now reduced to a pocket so small that it covers only the end of the tail of the chrysalis, \*and that the chrysalis itself has no longer any free segments.

Osborne's criticism was published in 1878, together with an excellent account of the real machinery by which pupation is accomplished. I find, however, that the errors of Réaumur have not only been copied into a continuous series of books since then, but have even been regarded as a possible explanation by Riley and Scudder. (vide Scudder's *Butterflies*, 1881, p. 35, and fig. 48 a-c). I have even heard a member of a London Society claim to have photographed the newly excluded pupa in the act of holding on by its intersegmental divisions. †

Osborne's explanation is that during pupation the last and sufficient bond of connection between the chrysalis and the old larva-skin is a membrane, extending from the lining of the latter to the anterior horns of the two lateral ridges bounding the anal area of the chrysalis. He dissected this membrane and prepared specimens with the membrane still intact. Osborne says (*loc. cit.*, p. 59) that this membrane is sufficiently strong and permanent to support the insect during the critical last moments of pupation, and shows that it also exists, though less perfect, in *Pieris brassicae* and *Euchloë cardamines*, which are by its means enabled to pupate suspended if the cincture is cut.

I do not know how far Osborne's observations will carry conviction. My excuse for calling attention to them in detail must be that they have been almost entirely ignored in this country for nearly 50 years. To my mind Osborne's explanation carries complete conviction. I cannot imagine a soft and easily ruptured newly-excluded pupa holding a spiny larval skin between two of its segments. I do not believe that anything of the sort has ever happened. Moreover I do not believe that, once having secured this grip the pupa could move the remaining segments sufficiently to free the cremaster from the larval skin, and I am quite sure it could not engage in the circular movements, which I have witnessed before complete attachment.

The question, however, need not rest here. It has been discussed by competent scientists (*E.M.M.* *tom. cit.*) and we must do justice to such observers as Réaumur and Harris (*Ins.*, p. 202, 2nd edn.) by conceding that they undoubtedly *believed* they saw exactly what they described. Let us therefore examine the explanation a little more closely, with the aid of Dr. Chapman and Mr. W. H. Edwards.

In *E.M.M.*, XV., p. 78, Dr. Chapman discussed Osborne's discovery and suggested that his "membrane" consisted merely of the linings of the tracheae, and that the "good old explanation" of the suspension (the inter-segmental grip) was largely true. Later (p. 136), having examined Osborne's specimens, Dr. Chapman withdrew this suggestion and stated that the membrane was undoubtedly an independent structure

\* The last of Osborne's three comments is perhaps hardly appropriate.—H.B.W.

† No such photographs have been published, however, and I am not aware that any have been exhibited.—H.B.W.

possessing special relationship to the suspension of the pupa. In the *Canadian Entomologist* for December, 1878 (*E.M.M.*, XV., p. 220), Edwards then gave his own independent observations. I think Chapman and Edwards explain how it is that the idea of the intersegmental grip has arisen. In the first place Chapman shows that the larval and pupal surfaces are damp, so that by capillary attraction and atmospheric pressure they adhere with considerable firmness, and strongly resist any separating force though they will gradually slide off each other. In the soft pupa the segments are not flat, but rounded, with deep folds between. The sliding larval skin therefore slides into these folds, and when the moment comes for the tail of the pupa to be withdrawn there is a bending back of the posterior part of the abdomen and this results in a pinching in of the skin for the moment. There is no seizing of the *outside* of the skin—Edwards points out that the spines would make this impossible—but a momentary grip of the *inside*. The tail free, this grip is released and the pupa hangs by the membrane alone. There is quite certainly no further grip.

Edwards made his observations on *Grapta interrogationis*, Chapman on another Vanessid species. There seems reason to think that it may be possible that there is some distinction in method in the case of *Danaïs archippus*. So far as the Vanessid species are concerned it seems clear to me that the grip which does occur is momentary and accidental, due to the adhesion of the two surfaces, and I think this view is confirmed by the experiments of Osborne and Edwards, made independently, and showing that *if the larval skin is folded back at the critical moment so that such a grip becomes impossible, successful pupation will still take place without it.*

There is still a hiatus. How does the pupa after freeing itself, get up to the pad of silk? Scudder is inclined to believe the elasticity of the supporting membranes is the explanation, and Edwards is of the same opinion while admitting that the rising of the chrysalis in this way is beyond his comprehension. I am rather inclined to believe that it also derives some assistance from the cremastral hooks. It has always seemed so to me when watching the pupation of *Aglais urticae*. This detail however must await further observation before anything more definite is asserted than that the pupa does *not* climb up by grasping the *outside* of the larval skin with its segments.\*

Here, for the moment, I leave this subject, in the hope that I have said enough to stimulate some of my readers to the making of further careful observations. Photographs are still desirable. My own show nothing clearly and the same applies to the series of photographs of the pupation of *V. io* in *The Pageant of Nature*, Part 2, p. 115.

The second point on which I propose to touch this evening concerns the variation of *Aglais urticae* and *Vanessa io*. I do not propose to take you at this stage a detailed and classified list of the named and

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\* It does not appear to be generally known that the pupa frees itself *entirely* from the larval skin before rising to the pad of silk, and is at first an appreciable distance from it. Cf. *Proc. Sth. Lond. E. & N. H. Soc.*, 1919-20, pl. II. (E. J. Bunnett). The article accompanying this plate is surely an instance of erroneous observation. The "finger-like processes" referred to appear to be the "sustentors" of Riley, representing the soldered anal prolegs of the larva, and undoubtedly play a part in pupation. The author of this paper, however, has neglected to study the scientific writings of Edwards and Osborne.—H.B.W.

un-named forms of these two species, but I must introduce the subject by describing very shortly the typical markings and giving a very general outline of the range of normal variation.

The markings of *Aglais urticae* have been described by Raynor (*Ent. Rec.*, XXI. 4-5) in some detail. He says:—

“The markings (liable to vary) are but few and simple. Each of the three black blotches along the costa of the forewings I have termed a ‘macula’; the large one in the centre of the inner margin is a ‘nota’; and to the two smaller ones in the central area the name of ‘puncta’ is appropriately given. The outer margin is naturally termed the ‘margo,’ and the blue lunulated spots within it ‘guttae.’ These complete the markings of the forewings. The outer margin of the hindwings also has a black edging, which contains blue markings similar to the ‘guttae,’ but which for the sake of distinction are here termed ‘lunulae.’ The only other variable portion of the hindwings is the central, red, transverse belt, which at once suggests its parent word ‘balteus.’”

These names for the markings have been adopted by subsequent workers, and to my mind are valid names for these markings, in the same way as such well known terms as “stigma” or the English “cell” or “discoidal spot.”

A comparison of these markings with those of *Vanessa io* must now be attempted. There are in *V. io* the same three black blotches—“maculae”—along the costa of the forewings, the third, counting from the base, being somewhat inconspicuous in ordinary specimens owing to its incorporation in the eye spot, and consequent modification. Figs. 14 and 16 of the plate devoted to the species in Frohawk show this “macula” fairly clearly, but it is most clearly to be seen in specimens transitional to *ab. belisaria*, Obth. There were excellent examples in the Horne Coll. in which the centre of the eye-spot was occupied by a distinct black macula, connected by rays with the 2nd normal macula. In *ab. belisaria* the 2nd and 3rd maculae coalesce, as in many aberrations of *Aglais urticae* (notably *ichnusoides*, Selys, and *atrebatensis*, Boisd.).

Normal *V. io* have no “nota” or “puncta,” but aberrations are not infrequent in which a nota is either present or is represented by a dark shade. I am not aware of the existence of specimens with “puncta” corresponding in position to those of normal *A. urticae*. The dark “margo” exists and the “guttae,” blue lunulated spots, occur, those nearer the apex being incorporated with, and forming part of, the eye-spot, the remainder being normally obsolete, but represented in aberrations rather commonly by dark spots. A chain of white spots, not represented in *A. urticae*, occurs within the red area, as in many *Vanessids*. The eye-spot, so conspicuous a feature of the apical region, is merely a modification of these markings with a suffusion of blue scales, the extent of which is one of the most variable characters of the species.

The hindwings of *V. io* are black, with a variable amount of red suffusion, principally on the anal area though frequently covering a great part of the wing. The markings consist of an eye-spot and a blackish crescent mark above and within it. The eye-spot is not similar to that on the forewings, but consists of a pale area in which is situated a large and roughly circular black spot. In this black spot

are three blue "bars" or lunules, of which the upper two normally coalesce.

Both *Aglaïs urticae* and *Vanessa io* are variable species and a host of forms of both species have been named. I do not propose to discuss these forms in detail this evening, but rather to indicate certain features in the variation of both species in which the two tend to approximate in marking, and I shall endeavour to show, by reference to such forms, what I believe to be the origin of certain of the markings of *V. io*. I should therefore say, in passing, that I consider *V. io* the younger species from the phylogenetic aspect and believe it has developed from an ancestor of a "tortoiseshell" facies, probably with a considerable resemblance to *Aglaïs urticae*. On this assumption the remainder of this paper is based and I shall therefore describe shortly the "progressive" forms of *A. urticae*, showing an advance in the direction of *V. io* and the "atavistic" aberrations of *V. io* showing indications of the more primitive markings of *A. urticae*.

"Progressive" variation in the markings of *A. urticae* occurs in conjunction with purely aberrant details in the same specimen, notably the union of the costal maculae, as in *V. io* ab. *belisaria*: *V. polychloros* ab. *testudo*; and parallel aberrations of *P. c-album* and other species. The occurrence of this form of variation throughout the group is suggestive of the markings of the primitive common ancestor, but this is not a subject about which sufficient can be ascertained to tempt us into a digression here. I shall therefore proceed to consider the progressive variation of *Aglaïs urticae*.

(To be continued.)

## Notes on the Lepidoptera of the Constantinople District (Asia) and Brusa.

By MAJOR P. P. GRAVES, F.E.S.

I had little time for collecting in 1922, but added two new species of Rhopalocera to the local list. The spring and early summer visits to Chamlija gave negative results as far as *Pontia* (*Synchloë*) *chloridice* was concerned. The fields it had frequented in fair numbers during the previous year had been ploughed up and it had disappeared. *Pararge roxelana* was common enough in early June as was *Eugonia polychloros*. On June 18th, I paid a visit to the Alemdagh Forest, which for once in a way was clear of brigands. I took a worn female of *Brenthis hecate* approaching *caucasica* about two miles from Alemdagh village, and in the forest found Argynnidids abundant. The species seen and taken were *Dryas pandora*, fairly common, *D. paphia* not fully out, *Issoria lathonia* abundantly, *Argynnis aglaia* on the way to the race *ottomana*, but already showing signs of wear, though the females were rare; two male *A. cydippe*, one of which had scarcely any silver marking on the underside of the hind wings, while the other was a large but otherwise fairly normal specimen, and abundance of *B. daphne*. The second brood of *B. dia* was just emerging. In one clearing *Melitaea athalia* race *mehadiensis* was frequent though going over. Dr. Reverdin has kindly determined it as *athalia*, not *pseud-athalia*. Another interesting discovery was *Heteropterus morpheus* of which I took a single female. This is the first time that this species has been recorded from Asia Minor to my knowledge. Occasional

worn *Heodes alciphron* race *meliboeus* occurred. *Coenonympha arcanius* and *Epinephele jurtina* were common and among the latter I took a large, but unluckily damaged, female *E. lupinus*, a species which I have only taken very locally at Chamlija previously.

At Brusa on July 7th-9th I had to confine myself to the plain. There, and for that matter in the outskirts of the town, *Hipparchia briseis* was common. I looked out for *Pieris manni* but am not satisfied that I obtained it. *P. manni* females and those of some of the Mediterranean *P. napi* of the summer brood are not easy to distinguish. *Pyronia tithonus* occurred rarely on the plain. *Plebeius argus* (*aeyon*) was not rare and seemed to be fairly normal in type. I found no *Chrysophanus rutilus* in the marshes, and but few *Everes argiades*. *L. camilla*, *D. pandora*, worn out *M. didyma* and a fair number of *P. aegeria* var. *intermedia* with occasional *P. maera* var. *orientalis* were also seen or taken. A large black Satyrid, probably *S. statilius* race *fatuaeformis*, Vty., was seen from the train near Yuruk Ali station at about 1,500 ft. elevation near Mudania.

I may here note that my second-brood *Hesperia malvae*, taken in the Constantinople district during the last two years, have all proved to be *malvae* after the examination of the genitalia by Dr. Reverdin.

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### Six weeks among the Butterflies of Eastern Switzerland. (With Plate.)

(Concluded from page 79.)

By B. C. S. WARREN, F.E.S.

The beautiful weather now broke; a walk through the woods to St. Moritz, on the afternoon of the 13th, after a day's rain, enabled me to box a pair of *Polyommatus eros* from a flower-head. The next day was wet too, and on the 15th we left Pontresina in a regular downpour, and reached Preda to find it turning very cold. By that evening it was snowing hard, and all Sunday the snow lay about three inches deep; Monday was little better, though it cleared up in the afternoon. The following day however, the 18th, was cloudless, and as the top of the Pass was still under snow, we went down; going as far as Bergün, getting on the old road below the railway viaducts.

Insects were abundant, though in no great variety of species. The only kinds not hitherto met with were *Erebia pharte* and *Heodes virgaureae*; for the rest the following were taken or seen, and were more or less plentiful: *Hesperia malvoides*, *H. alveus*, *H. serratulae*, *Aricia eumedon*, *A. medon*, *Cyaniris semiargus*, *Lycaena arion*, *Plebeius argus* (*argyrognomon*), *Papilio machaon*, *Parnassius delius*, *Aporia crataegi*, *Brenthis euphrosyne*, *B. amathusia*, *Argynnis aglaia*, and *Erebia melampus*, *E. euryle*, and *E. stygne*.

The next day was again wet, but the 20th was as perfect as could be wished. We started early for the top of the Pass, with great hopes of finding *Erebia glacialis* and *Melitaea asteria*, the latter of course being our principal object. The walk up, being early in the day, produced little; the short cut from the Weissenstein Inn to the Teufels Tal only produced one *P. delius*. The wild Teufels Tal, on the contrary, gave us one ♀ *P. delius*, one *Pontia callidice*, two *M. aurinia*, race *merope*, several *B. pales*, one ♀ *Erebia glacialis* and several *E. gorge*, and one *Pyrameis cardui*. A remarkable list for such a locality.

The top of the Pass, however, presented a fearful sight, from the entomologist's point of view. It was overrun by hundreds of cows, and as a natural consequence the grass was eaten down as short and even as if a mowing machine had been taken over it. Less than an hour's futile search showed that the butterfly fauna of this famous locality is a thing of the past; a few *Melitaea cynthia*, *M. aurinia* race *merope*, *Brenthis pales*, one *Erebia glacialis*, and a few *E. lappona* were the only species seen: only two more than we took in the Teufels Tal, and only a very few specimens of each. It was a sad sight. We had our lunch and started down again, keeping to the road all the way. Immediately after leaving the Teufels Tal a number of *E. glacialis* were observed on a rocky slope just above the road, and several specimens secured. A little further down the road winds round several grassy hillocks, covered with *Vaccinium* bushes. These hillocks looked so attractive that we climbed to the top of one, and immediately disturbed several *Colias palaeno*, which we found to be abundant all the rest of the way to the Weissenstein Inn. On the first hillock we went up, in less than a quarter of an hour, we took twelve ♂♂ and seven type ♀♀ (white), and seven ♀♀ var. *herrichi*, of varying shades of yellow. The capture of this fast-flying species here presented no difficulty, as the soft grassy slope was as easy to run over as a tennis lawn; the insect, too, frequently rested on the numerous *Vaccinium* bushes, from which it could be swept-up in a most leisurely manner. Just here, too, I took the only *Hesperia andromedae* I saw on the Pass.

Below the inn, the grassy slopes on both sides of the road produced a fair number of ordinary species, among which the most interesting were, *Albulina pheretes* and *Polyommatus eros*.

The next morning, July 21st, was again cloudless, and we decided to follow a very narrow path, which could be seen skirting the side of Piz Palpuogna in a westerly direction, and which we thought might lead to the Tschitta Pass. In this we were mistaken, for after about an hour and a half of climbing, the path rounded the western spur of Piz Palpuogna, and turned up a beautiful Alp covered with *Vaccinium* bushes. Due west of this Alp, at the opposite side of a deep valley, the real path to the Tschitta Pass was clearly visible. As it was impossible to cross the intervening valley, we continued our way up the Alp, on which we soon found *Colias palaeno* to be just as abundant as it was on the Albula road. It was quite a surprise to me to see in these localities the two forms of the ♀ flying together in almost equal numbers; the ab. *calvischi* was common too, in both sexes. The species was so plentiful that there was no need to pursue it, for one could get plenty of specimens by just taking those that flew close to one. On three occasions I boxed freshly emerged specimens resting on the *Vaccinium* bushes, without using my net. The only other species about were *E. lappona*, *Brenthis pales*, and one fresh ♂ of *Vacciniina optilete*.

Once above the zone of the *Vaccinium* we reached some rock-strewn slopes, on the south side of Piz Palpuogna. Here a few *Hesperia calciae*, *Brenthis pales*, *Melitaea aurinia* race *merope*, *Pontia callidice*, and *Pyrameis cardui* were seen; and of course the ubiquitous *E. lappona* and *C. palaeno*, which latter was in more perfect condition at this altitude, just on 7000 feet. We had been wandering about for a short time when I came on a grassy gully, more sheltered from the cold north wind, which was blowing, than the rest of the hill-side. On

going down into it a small butterfly was disturbed from the grass, and a moment later I was delighted to find I had a beautiful specimen of that rarity of the High Alps, *Melitaea asteria*.

After our experience on the Pass I had quite given up hope of taking the species this year; but here it was, just emerging, and in plenty. We took in a few hours a really beautiful series of ♂♂, but only two ♀♀. We were, however, fortunate enough to get a good many more of the latter next day, and were also glad to find that its habitat was more extended than it had at first appeared to be. *Erebia epiphron* and *Hesperia andromedae* were two additions to the list of the day before.

The variation to be seen in my series of *M. asteria* is remarkable; the amount of black on the upperside, and the formation of the markings on the hindwing underside, being the chief factors of this variation. Mr. Wheeler observes in his *Butts. of Switz.*, that his experience of the species shows it to be very constant, but that Frey notes it as being "rich in vars." Frey's signature is to be seen in the Visitors' Book at the Hotel in Preda, and one wonders if his opinion as to the variability of *asteria* was formed from examining a series from Piz Palpuogna; although he apparently only recorded the species from the top of the Albula Pass.

A week of almost continuous bad weather, rain and snow, with very cold winds in the few fine intervals, prevented almost all further collecting until the 29th, the day we were leaving Preda. That morning was so perfect that we felt we must try and get to the Fuorcla da Tschitta, which we had been hoping to do for the past five days. So, although our train left at five p.m., and the top of the Pass was well over 9000 feet, and consequently almost impossible to reach in the time, we determined to go as far as possible.

To get on to the path for the Tschitta it is necessary to descend the road for about half a milé, when passing through a group of chalets one gets the one and only bridge which crosses the river, which descends the valley from the Tschitta. Across this bridge the path ascends through fir woods for the first 500 feet, and on entering the wood I took a worn ♀ *Melitaea maturna* ab. *wolfensbergeri*, and an equally worn ♂ and ♀ of *Brenthis thore*, both species which we had not hitherto seen on the Albula.

After rising above the woods, the path runs up the valley with the river on the left, and beautiful grass-grown slopes on the right, which conditions last until the head of the valley is reached, where the real climb begins. All the way up butterflies swarmed, every step one took seeming to disturb dozens. The variety of species was not so striking, but the number of individuals was enormous. The Erebias held first place, *melampus*, *euryale*, *pharte*, *epiphron*, and *tyndarus* were in hundreds, *manto*, *mnestra*, and *gorge* were coming on, no ♀s of the three latter being seen. *Colias palaeno* and *C. phicomone* were also very abundant, and *Hesperia serratulae* and *H. calcaliae* likewise. *Parnassius delius* was also fairly abundant; one very fine ab. *leonardi* being taken, which is entirely without red marking on fore- or hindwings, the black apical spots of the forewings being also obsolete. The Lycaenids were but poorly represented, though perhaps they did not get their fair share of attention, for want of more time. At the head of the valley the path is lost in the grass, and one has to take the direction

from occasional splashes of colour on rocks which here and there protrude from the grass. After a very steep rise of 800 feet one leaves the vegetation behind and comes to traces of the path again, between patches of snow, and the butterflies which have been lessening in numbers all the way up the Alps, are now replaced by a few very worn *Erebia lappona* and *E. glacialis*. At this point we were still about 1000 feet from the top of the Pass, but as the best of the collecting ground was obviously behind us, and the time getting short, we turned back. No sign was seen of *M. asteria*, and the vegetation seemed to be of a coarser nature than that found in the localities where the species occurs. The whole of the valley, up to about 8000 feet, deserves more time and attention than we were able to give it; but although we had to hurry we had no cause to complain of the results obtained.

We caught our train comfortably, and reached Zernetz that evening. It is a quaint old town, permeated with the scent of hay. The reason of this is that almost every other house is a barn, in which the rich crops of hay from all the valley round are stored. Stout-built, three-storied houses, with balconies, shutters, and in some cases even a coat of arms over the front door, are nothing but barns for hay; that at one time they were the homes of well-to-do families is certain, but now hay is supreme in Zernetz. We were woken up next morning, July 30th (a Sunday too), by the tolling of the church bell, at 4.30 a.m., not to call the population to church, but to turn the whole town out to cut hay. The weather had been bad for some time at Zernetz, so now they were making use of the sunshine in the proverbial manner.

We, however, did not go out until the afternoon, when we went some miles up the Ofen Pass. For the first mile or two above Zernetz the great interest of the road was the abundance of Lycaenids. Here, swarms of *Cyaniris seniargus*, *Aricia eumedon*, *A. medon*, *Hirsutina damon*, *Polyommatus hylas*, *Plebeius argus*, and *P. aegon* were collected round every moist patch on the road; and on the grassy banks the ♀s were equally numerous; while *Agriades coridon*, *A. thetis*, *Polyommatus icarus*, *P. eros*, *Lycaena arion*, and *Vacciniina optilete*, were all well represented; and a few *Polyommatus amandus* brought the total of "blues" present up to fourteen species. Next to the "blues" the most abundant species was *Erebia goante*, the ♂s of which were very common and in lovely condition, but only two ♀s were seen.

Memories of the fine description of this part of the Pass, by our late Editor (vol. XXI., p. 197, made us push on in spite of the numerous attractions, and shortly before reaching the Val Laschadura bridge a few worn *Erebia ceto* were taken. The road doubles back from the bridge in a long sweep, along the mountain side through the forest, and, almost directly after emerging from the trees, skirts along the mountain side with a great precipice on the right: the place so vividly described by Mr. Tutt in his article, and which he justly called "one of the most delightful pictures in the Alps." It was here he found *Erebia nerine*, and we did likewise; but it was only just commencing to emerge, and not at all abundant as on the occasion of Mr. Tutt's visit, which was what we had hoped for, as we were a fortnight earlier than he had been. We took a dozen ♂s, and with a fortnight before us felt no doubt we would be able to get as many as we wanted before we left. The next two days we spent on the road again, going as far as the Pont della Drosa, about eight miles from Zernetz. *E. nerine*

occurred the whole way, in varying numbers, the ♀s still being few and far between. To the "blues" already mentioned *Aricia donzelii*, was a welcome addition.

The next two days were wet, but August 5th, although cloudy to start with, gave promise of improvement, so we devoted it to a visit to the famous Val Cluozza. The whole of this valley lies in the National Park, and forms the most accessible way into that extraordinarily wild district, which is now the great national preserve, and known as the National Park. The district lies south of the Ofen Pass, stretching from the valley of the Inn eastward for about fourteen miles, beyond which another preserved area lies to the north of the Pass. The species which I was able to note were of considerable interest, but as all fauna and flora are strictly preserved it is useless to go there with a view to collecting. The vegetation of the valley is extremely rich; every variety of pine tree which grows in Switzerland occurring in that valley. Among the numerous animals existing in the preserve are the famous steinbock, bears, etc.

The ascent of the valley is steep, the path winds up through the fir forest for 1800 feet, and emerging then on the mountain side gives one a very fine view of the whole valley. Through the woods there had been very few butterflies about, but at the high level along the side of the valley numerous kinds were seen. *Vacciniina optilete* was in larger numbers than I have seen it before in the Alps; and *Erebia nerine*, too, was quite common. *Polyommatus eros* and *Albulina pheretes* occurred occasionally.

After running very gradually up for some time, the path descends again to a small house, far down in the valley, where a keeper lives, and one can obtain a room for a night; so as we wished to get as high up the valley as possible, we left the path and made our way onwards and upwards. By midday we came to some beautiful Alps, at an altitude of nearly 8000 feet, a good way south of Murtaröl, a fairly high peak which rises between the Val Cluozza and the valley of the Inn. On this Alp some *Erebias* were fairly abundant, among which was a curious form of *mnestra*, in which the ♀s had white centres to the black spots on the forewings, a feature also exhibited by the ♀ *glacialis*, presumably var. *alecto*. *E. gorge* was also about, and of truly eastern character, the development of a full complement of black spots on both fore- and hindwings being much more pronounced than in the specimens from the Bernina district. So far as I could ascertain, on the heights above the Val Cluozza, var. *triopes* is racial, and completely replaces the type, which latter is of frequent occurrence in the Bernina district. The most unexpected sight of the day occurred when we were at lunch, when a ♀ *Melitaea asteria* fluttered up to the rock on which we were sitting; and continued to fly round it throughout the whole of our meal. Through the rest of the afternoon we saw several more, all very worn; but one was glad to note that the species evidently occurs all over the Alps along the south side of the Val Cluozza, above 7500 feet.

By four o'clock we were successful, after a long and extremely steep climb, in reaching the summit of a col, at an altitude of just over 8000 feet, some miles south of Murtaröl. From here the view in all directions was extraordinarily fine. One could see to the south-west far up the Engadine, and eastwards over the range of mountains fringing the

Ofen Pass, to the jagged peaks of the Dolomites. The wild nature of the country at the head of the Val Cluozza, and eastwards from it, is past describing; and the grey, bare, precipitous cliffs of the Piz del Diavel (so called because from its base to its summit it is absolutely devoid of vegetation) make a fitting termination to this magnificent valley. The day, however, was changing, and the sky by now was leaden with clouds, and driving rain storms could be seen on several of the surrounding mountains, which, although adding to the extreme grandeur and desolation of the scene, reminded one it would be advisable to be getting down from this exposed observation point, especially as we had some 1700 feet of precipitous mountain side to descend before coming to the path again.

The only animals we saw were two chamois, at about one hundred yards distance; we did not see any steinbock, or bears; but though disappointed about the former, we did not feel the absence of the latter a very distressing omission. Personally, I think if I were a zoologist, who came to Switzerland really wishing to see bears, I would visit the capital and not the National Park; though I willingly admit that the country round the Piz del Diavel quite looks (if not lives) up to its reputation.

After this extremely interesting day the weather broke again, and in the next four days but little collecting could be done.

On the 10th we again went up the Pass as far as the locality for *H. nerine*. On the way up *Aricia donzelii* ♂s were now quite abundant, but still no ♀s were to be found. The ♀ *nerine*, too, were never really abundant like the ♂s had been; still by careful work we got a good series of them. *Hirsutina damon* deserves special notice, for besides being literally in hundreds, a very large proportion of them were of very small size, so small, in fact, that one was continuously mistaking them for *A. donzelii*.

We left Zernetz the next day, and so ended an unusually successful expedition; but I may perhaps note in conclusion, a remarkable change which has taken place in the Alps. The old diligence has disappeared from all the big Passes, and beautiful motor ones replace them, even in the Grisons where motors are otherwise not permitted. The consequent saving of time in driving over a Pass is enormous, even though the motors never travel at all fast. It is now possible, instead of taking six hours, to drive from Zernetz to Santa Maria, to cross the Ofen Pass and reach the top of the Stelvio, and return to Zernetz, all in the day.

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## CURRENT NOTES AND SHORT NOTICES.

The following note has been received from the Carlisle Natural History Society:—"Ten years have elapsed since the publication of the last volume of the Transactions of the above Society. Owing to the war and the greatly increased cost of printing it has not been possible to resume publication earlier, but another volume is now in the press and will be issued shortly. This volume will contain the following papers:—

"1. Addenda to Macpherson's 'Vertebrate Fauna of Lakeland,' by (the late) Eric B. Dunlop, and Appendix by L. E. Hope, F.L.S.

"2. The Lepidoptera of Cumberland, Part III. (Geometrae), by G. B. Routledge, F.E.S.

"3. The Coleoptera of Cumberland (conclusion), by F. H. Day, F.E.S."

Reports of collecting continue to emphasise the unpropitious nature of the weather from an entomological point of view. The absence of the sun's rays and the prevalence of the north wind for a lengthened period seems to have prevented emergence in any quantity. Four days in the country, May 30th to June 2nd, gave only two specimens of *Pieris brassicae*, and nothing else but a few, very few, small fry. Nothing could be stirred from the grass, during a walk along the famous Pilgrím's Way in Kent. A long walk in the rich Surrey district produced a few *Hamearis lucina*, and odd specimens of eight or ten other species of Rhopalocera, but only on a slope sheltered from the incidence of the cold current of air.

In the *Rev. Mens. Soc. ent. Namur.* for May, M. Cabeau calls attention to four striking aberrations of Rhopalocera diagnosed by M. Girard, *Traité d'Ent.*, III. (1873-85), but which have hitherto remained unnamed. These are now named by M. Cabeau as follows. An *Aylais urticae* with the wings entirely white taken at Bondy near Paris, in 1859, is called ab. *bellieri* from its captor M. Bellier. A *Dryas paphia* with an oval white spot on each wing taken near Paris by M. Caroff, is called ab. *caroffiana*. An *Epinephele jurtina* which is wholly white, wings, head, and antennae, a female taken at Bondy, is named ab. *leucothoë*. And a *Callophrys rubi*, green on the upperside as well as on the lower, taken near Paris by M. Caroff, is named ab. *amphichloros*. What a cumbersome method it is to name aberrations of this character with a multitude of irrelevant terms. The same class of aberration occurring in many species might readily be designated by the same term, which would indicate to the future students, the nature of the aberrant form, without any effort of memory, or any prolonged research. A system of aberrational nomenclature of this character was proposed some years ago for the undersides of the *Lycaenidae*, by M. Courvoisier in Switzerland, but he died before it was really discussed.

A curious aberration of a male *Euchloë cardamines* is announced by M. Derenne in the *Rev. Mens. Soc. ent. Namur.* On the forewing the discoidal spot is enlarged as in the female, and the costal margin is much emphasised with black, which widens towards the end of the cell and nearly touches the discoidal spot, from whence it runs on by a narrow praecostal extension to the apical area. This aberration is called ab. *scheepdaeli* from its captor.

In the *Canadian Ent.* for March there are some very interesting remarks by H. L. Seamans on "Forecasting Outbreaks of the Cutworm (*Porosagrotis orthogonia*)" in Alberta based on meteorological observations made during the past fourteen years. The data shows that "any year which has less than ten wet days in May and June, is followed by corresponding increase in the infestation of *P. orthogonia*. Years which have from ten to fifteen wet days are followed by some decrease, while years with more than fifteen wet days are followed by an almost total disappearance of the pest." Other facts are (1) that wet weather brings the larvae to the surface of the ground to feed, and they only retire when the ground dries; (2) that the parasites become active as soon as the rain is over and while the larvae are still compelled to feed above ground.

Another portion of the *Catalogue of Indian Insects* has been issued, viz., Pt. 3, *Bombyliidae* (Dip.), by R. Senior White, and aims at being a complete reference and synonymic list with indications of the distribution of the various species.

The Imperial Entomologist, T. Bainbrigge Fletcher, of the Agricultural Research Institute, Pusa, India, has compiled and issued a comprehensive List of Publications on Indian Entomology in 1920-21, consisting of over 70 pages. It consists of an alphabetical list of the Authors of all papers, etc., with an analysis of each indicating its contents. A most useful work of reference.

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## REVIEWS AND NOTICES OF BOOKS.

A BIOLOGY OF THE BRITISH HEMIPTERA-HETEROPTERA.—By E. A. Butler, B.A., B.Sc., F.E.S. Pp. I.-VII.+682, with coloured Plates, Photographs and Text Figures. London, H. F. and G. Witherby, 1923. Price £3 3s. net.

Of the 473 species of bugs dealt with in this attractive volume, which has recently come into our hands to review, a description is only given of those species, some 40 in number, which were new since Saunders' *Hemiptera-Heteroptera of the British Isles*, published in 1892. This work is therefore not intended to take the place of Saunders' book, but to be used with, and as an addition to, it. Moreover, as it is there are 682 pages against Saunders' 350, and should the author have given a new description of all the British species, the book would have been too unwieldy for one volume, and the cost no doubt prohibitive for most entomologists' pockets.

The binding, size, and general get-up is similar to that of the large edition of Saunders'.

Considerable attention is given to the earlier stages in the life-history of these insects, which have been much neglected heretofore, and the data is chiefly taken from Mr. Butler's own observations and discoveries. Many of the eggs, and larvae, very young and more advanced, are described and figured; and the habits, habitat, and distribution of all the species is given as far as is possible.

It may be as well here to give briefly a general view of the work:—After a short preface, in which the author explains the scope of the book, and gives generous thanks to all those entomologists who have helped him in any way, comes a very interesting Introduction extending over 14 pages, which is both instructive and useful to the general entomologist as well as to the Hemipterist. On page 15 a valuable table is given to aid in the determinations of Families in the larval forms of the non-aquatic Heteroptera. We next come to the body of the work dealing with the Sections, Families, Subfamilies, and Species (pp. 16-602). Under each species, as far as is possible, the Ova, Larvae, Life-Cycle, Habitat, and Distribution, are described and expounded. The synonymy and references to each species are brief (no doubt on account of space), and only refer to the original description, and the reference to Douglas and Scott, and Saunders, or where first added to the British list since the latter work.

On page 351 new tables are given for the difficult subfamilies of

*Capsidae (Miridae)*, and of the division of the subfamily *Mirina*; and on page 353, a new analytical table of the division *Miraria*.

16 pages are devoted to the Bibliography; 9 pages to a List of the British Hemiptera-Heteroptera, arranged according to Oshanin's Catalogue (1912); 11 pages to seasonal distribution in a tabular form for each month; and 17 pages to a table showing the distribution in England, Scotland, Ireland and Wales. Pages 672-78 consists of an Index to all the Plants mentioned in the book, arranged under their Natural Orders. Finally we have an Index of the scientific names of the insects themselves. The Myrmecophilous species (those bugs which are generally found with ants, or in ants' nests), with which we ourselves are best acquainted, are quite fairly dealt with; although we naturally attach more importance to them, and especially to the meaning of their mimicry of ants, than does Mr. Butler. We are able to add a few records, etc., which have been omitted:—

*Podops innucta*, F.—The Rev. Canon Fowler recorded two specimens in an ants' nest at Sandown, I of W. [*Ent. Mo. Mag.* 19 161 (1882)].

*Stygnocoris pedestris*, Fall.—Mr. Keys took a specimen in the midst of the ants in a nest of *Myrmica scabrinodis* at Plymouth [(Donisthorpe) *Ent. Rec.* 14 38 (1902)]. Mr. Bouskell also sent me a specimen in a nest of *Myrmica ruginodis*, taken near Caragh Lake, Co. Kerry, in June, 1912.

*Tropistethus holosericeus*, Scholtz.—As pointed out by Mr. Butler, Dr. Putton and others have recorded this species from ants' nests on the continent; but he says, however: "There is no record of such an occurrence in Britain." Mr. Jennings took it in an ants' nest at Dorking in 1897 [(Donisthorpe) *Ent. Rec.* 14 38 (1902)].

Probably all these three species, and certainly the first two, are not really myrmecophilous insects.

*Nabis lativentris*, Boh.—Mr. Butler gives a very good account of this bug (pp. 271-75) and also a fine coloured figure of the nymph (Pl. iv., f. 1). He states, however, that there are no records for Scotland. Morris Young records it from Longbank [*Clyde Area List* 307 (1901)].

*Piezostethus formicetorum*, Boh.—To the four localities in Britain—"Glen Lui, Braemar, Rannoch, and Nethy Bridge" (in the last two of which we had the pleasure of first discovering the insect) given by Mr. Butler, we are able to add two more, namely, Bridge of Gairn (J. J. F. X. King); and Westerham, Kent (Philip Harwood) [(Donisthorpe) *Ent. Rec.* 34 5 (1922)].

*Myrmedobia coleoptrata*, Fall.—To the six English counties given for the British distribution of this species (p. 345) we are able to add one more—Surrey; where we took the ♂ at Oxshott with *A. (D.) fuliginosus* [*Ent. Rec.* 14 37 (1902)].

*Pilophorus perplexus*, De G.—We took this species by beating young fir trees covered with *A. (D.) niger* on September 2nd, 1905, at Parley Heath, just in Dorsetshire, which adds a new county to the British distribution.

Taken as a whole we must congratulate Mr. Butler on his patience and perseverance in producing such a fine work, which is indispensable to the Hemipterist, and we wish it every success.—H. St. J. D.

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**Observations on the Family Coleophorides.—The Case.**

By ALFRED SICH, F.E.S.

*(Continued from vol. xxiv., p. 89.)*

One of the most essential conditions to lepidopterous larval life is that of moisture. Although certain larvae of the *Tineidae* and *Oecophoridae* are able to carry on their existence feeding on old hair, feathers, or other substances under exceedingly dry conditions, the majority of the *Tineina* need in their early stages a comparatively large amount of moisture. Another necessity to their successful life is the possession of means to escape the attention of other creatures that prey on them. The methods by which these two necessities are secured vary greatly. In the family under consideration and its allies, the *Lithocolletides* being very small insects are able to meet the difficulties by remaining between the cuticles of a leaf of their foodplant during the whole of their larval and pupal life. The *Gracilariides*, at least the larger species, pass their early larval life in a leaf and later, when the larva grows larger, either roll the leaf edge, or twist the apex of a leaf into a cone-shaped dwelling. The *Coleophorides* solve the problems by first living among flowers or seeds or in a mine in a leaf, and later forming a portable habitation, which may resemble other objects, but has not the appearance of a soft larva. Eventually this case is used as a convenient pupal habitation, but I believe it had no such origin. It was primarily a larval dwelling like the cones of the *Gracilariids*, which are not used as cocoons. Even now at least one species of *Coleophora*, *C. salicorniae*, is known to quit its case before pupation and *Goniodoma limoniella* does so likewise. The case may then be considered originally as a habitation for the larva when it had become too large to hide in a calyx of its foodplant or between the cuticles of a leaf. As it is we may observe Coleophorid mines in *Holostea*, *Lotus*, *Ulmus* and *Corylus* from a distance, and if even the half grown larva were to live in the mine without a case, its mine would become so large as to be strikingly conspicuous. This is avoided by the larva dwelling in a case and making numerous small mines. The case is firstly constructed in order to retain the larva in a sufficiently moist condition, and secondly to protect it. Whatever the exterior of the case may present to view, the interior is always a hollow cylinder more or less closed at one end and lined with a substance apparently impervious to water. This may be silk applied as a fluid or it may be some special secretion. The result is that the case becomes very tough and opaque. After the larva has taken a meal in the wet interior of the leaf it retires into the case. Here even in a dry wind it is protected from undue loss of moisture and from too sudden change of conditions from a wet mine to a dry atmosphere or even hot sunshine. In those species which do not mine, the case surrounds them with a non-absorbant material, which prevents undue loss of their own moisture and also protects them against the inclemencies of the atmosphere. The same advantages are secured to all species while the larva is changing its skin, and more especially while undergoing the long winter sleep which may last from August till the end of the following April.

I will now describe in detail how some of the cases are constructed and enlarged. Each species has its own method and strictly adheres

JULY 15TH, 1923.

to it. It shows how strong is the instinct, inherited memory, or whatever we may call it, when we find a solitary larva forming its special case without instruction or example in exactly the same manner as did its parents, whom it has never even seen. Sometimes *C. caespititella*, *C. argentula* and probably other seed-feeders will, before making a case, form tubes or galleries of silk and vegetable atoms in the seed heads of their foodplants. These tubes, I imagine, enable the larvae easily to reach the seeds which are usually on the surface of the head, or when feeding to retire rapidly into the interior if danger threatens. Later in life these larvae make short portable tubes which they turn into cases. The case of *C. caespititiella* is typical of the Coleophorid. It is fairly cylindrical, its length about five times its diameter, it is somewhat flattened at the distal end where it is closed by three conical valves which meet at their apices. At the other end is the circular mouth strengthened by a slight lip or flange running outside. Above the mouth the case is slightly restricted. This species is fully grown in Autumn but *C. glaucicolella*, which forms a similar case, may be found feeding in Spring. *C. alticolella* uses the calyx of the rush as a foundation to its neat case, and *C. sylvaticella*, a fine species discovered by Dr. Wood, employs the calyx of *Luzula* for the same purpose. This species is one of those that take two years to reach maturity. When young it feeds on the seeds and after hibernation it commences eating the flowers in early summer. It passes the second winter as a full grown larva. Another of Dr. Wood's discoveries is the small *C. agrammella*, this makes a straight silken case with alternate light and dark longitudinal stripes. Its favourite food is *Juncus conglomeratus*, on which it feeds at the same time with other species. For this reason and from its small size it has been overlooked, but I have recorded it from Sussex and have found it in Surrey. The late Dr. Wood's fruitful *Study of our rush-feeding Coleophorae* has been recorded in a highly interesting manner (*E.M.M.*, 1892). I have examined the cases in which *C. laripennella* passes the winter to see which authorities were correct and found that it is really more or less covered with grains of sand, not with meal of the footplant only. The case of *C. virgureae* is better hidden in the seed heads of *Solidago*, because the larva decorates it with some of the pappus. *C. artemisicolella* feeds on mugwort and *C. deauratella* living in flowers of clover, use parts of the flowers in forming their cases, but I have seen neither of them. I have found *C. frischella* on *Melilotus*; its case is formed of the shells of the seeds and has the appearance of a row of small beads. This species and others have been recorded as passing two years in the pupal state. It is not therefore wise to pin in the cabinet, without examination, those cases which do not yield the imago the first season.

Though I have found several cases of *C. albicosta* on furze bushes, its method of treating the calyx out of which its case is made, has escaped me. I confess that I have never seen any of the seed-feeders in the act of forming their cases, they live hidden away while young and are therefore difficult to observe minutely. When in their final cases they are more easily noticeable, indeed the rush feeders are quite conspicuous when their cases stand out from the seed-heads, and we then see how the larvae need the shelter of their cases for we sometimes find them where the rushes are growing in very bleak spots. The same may be said of *C. argentula* when feeding on the tops of

yarrow plants in an open field. These are however the exceptions, for the Coleophorid is pre-eminently a lover of sheltered situations. As those plants that nourish the seed-feeders perfect their seeds in late summer and autumn and lose most of them before next spring, it is natural that the larvae should feed up quickly and hibernate fully grown. *C. ornatipennella*, only eating seed when young, hibernates in the third stadium; our *C. livella* probably does the same. While on this question I may say that I have reason to believe that nearly all our British species and those inhabiting central and northern Europe hibernate either in the third instar or as fully grown larvae and that none pass the winter in the oval, pupal or imaginal state. Some of the seed-feeders have been observed to supplement their diet by eating the leaves of their foodplants as well as the seeds. Mr. H. J. Turner says that *C. artemisiella* will eat the leaves as well as the seeds and Baron Crombrugghe states that *C. artemisicolella* does so likewise (*Ann. Soc. Ent. Belg.*, 1907, p. 33).

We now have the leaf-miners to consider, and it is among them that we find the most interesting cases and here we can actually watch the progress of construction. There is no doubt that the form which some of the cases take is of cryptic value and does deceive casual enemies, but it is no protection against special parasites. There is one casual enemy against which the Coleophorid is protected by its case. This is the ant. In Britain ants are not so abundant, but in warmer parts of Europe, in north Italy and along the Mediterranean coast for instance, they are continually running over the leaves of trees and herbage. I have seen them running against Psychids crawling on tree trunks, these then promptly brought down the mouths of their cases on to the bark and the ants then took no further notice of them, though they sometimes run over the case. The Coleophorid when crawling must be protected in the same way. Insectivorous birds, especially titmice and the warblers, carnivorous beetles and Hemiptera, earwigs and a few solitary wasps are other casual enemies against which the case in its various forms is more or less protective. Any botanist, who has examined living plants under a good lens, must be aware of the numerous mites, thrips and minute immature forms of insect life, which haunt especially the flowers and the angles of the veins on the underside of the leaves. Mites, I am sure, destroy *Lithocolletis*, when by accident they are able to enter the mine, but I have seen them and other minute creatures worry unprotected larvae by running about them. The Coleophorid when in its case or mine is free from such unwelcome attention.

The dire enemies are the various species of internal parasites belonging to the Hymenoptera. These destroy great numbers of Coleophorids. I have bred fairly large species, many smaller and numbers of minute ones. They all eat a round hole through the wall of the case on emergence. I have never seen any of these attack a larva; they may be able to pierce the case with their ovipositors. If they do this just after the larva has changed its skin, I imagine, they would meet with little resistance. The minute species may gain access to the case by squeezing themselves in between the valves at the apex. In 1919 I gathered a number of cases of *C. vibicella*, of which about ninety per cent. produced numbers of minute brilliantly coloured Hymenoptera. In 1920, wishing one day to obtain living pupae, I

gathered the first dozen cases I saw, ten *C. fuscedinella* and two *C. ibipennella*. On examination every one of these was found to contain parasites. These are instances of exceptionally severe attack. In some years very few parasites will be bred. These Hymenoptera are beautifully fashioned and, in contrast to many parasitic forms of life, show no loss of vital force. They appear to be gifted with as high an intelligence as any insect. I do not think I ever bred a dipterous parasite from a Coleophorid, but believe I have read of such an occurrence.

Before describing the actual methods of case-making I am tempted to say a very few words on silk. To the Coleophorid, and one may say to all Lepidoptera, silk is a necessity. Without silk they could make neither their larval nor pupal habitations which so many of them now find indispensable, and even those larvae which form no such dwellings, as certain *Satyridae* and *Lycaenidae*, which are said to pupate simply on the ground, need silk when changing their skins. Lepidopterous silk, like Arachnid silk, appears to vary in its properties. Sometimes it contracts on exposure to air, sometimes it shows no such contraction. It is highly interesting to watch a larva under a lens while it is forming its dwelling. A small *Gracilaria* larva has no bodily strength to roll the edge of a leaf. What it does first is to spin very rapidly a large number of silk threads parallel to each other along the extreme margin of the leaf and at right angles to it. In a very short time we see the margin folding inwards. This can only mean that the silken threads have contracted and drawn the edge of the leaf over. This also shows that the silk at each end of the threads has a very strong adhesive property. On the other hand when we watch a *Bucculatrix* building its beautiful cocoon we observe that it forms a series of arches which remain standing upright. When the first half of the cocoon has been made, the larva which until then had been lying outside, crawls under the arches and completes the second half of the cocoon over its body. Here there is no contraction of the silk or the arches would collapse. I believe Coleophorid silk has both properties, as the cuticles of the leaves, out of which many cases are formed, are very closely united; on the other hand the beautiful arches by means of which *C. palliatella* forms the scales that adorn its case appear to be made of incontractable silk, as well as the whole case and probably all the silken cases. One of our most common species is *C. lineolea*; its egg is laid on the upper surface of the leaf of *Ballota* or *Stachys* where these plants grow under the shelter of a hedge or even a wooden paling. On hatching, the larva eats its way through the base of the egg shell into the leaf, where it makes a minute mine, at this stage leaving its excrement in the mine. After a few days it changes its skin in the mine and then commences to form its first case. The mine consists of an oval space, out of which the larva has eaten the green cellular tissue, leaving only the upper and lower epidermis of the leaf entire. The larva now bites a slit in one of the cuticles and a corresponding slit in the other and then fastens the inner edges of both firmly together with silk. Then, if I remember rightly, it goes to the opposite side of the mine and repeats the process, but the slits here lie at an angle to those first made and very nearly meet them at one point. Now the larva severs the cuticles at this point, but does not fasten them together. The result is that a minute tongue-shaped

sack is formed with its wide mouth still attached to the leaf. If we examine the leaves of the above mentioned plants in the middle of August, we may see these sacks partly cut free of the leaf. After the larva has taken a few meals in the mine it returns to the partly made case, and getting inside cuts it entirely free from the leaf and wanders away. Finally it fastens the case with silk to the underside of a leaf and commences a fresh mine. As the larva grows the case becomes too small, so it fastens the mouth end to the edge of a leaf and mines out the portion lying around as far as it can reach without leaving its case. It then cuts out and fastens together the two cuticles on each side of the mine, but leaving a small portion opposite the mouth of its case uncut. Finally this portion is cut and the larva crawls off with its case, which is now longer and wider. After a short time it lines the fresh part of the case with silk, or whatever the substance may be which renders the case tough and opaque. After making one or two similar further additions to the case and, I believe, again changing its skin, this time in the case, it crawls off the leaves and fastens its case to the stem of the foodplant near the ground, or to some adjacent stem of the hedge, or even to a wooden post, if there be one. Here it passes the winter and in March or April wakes up and mounts the new young stems of the plant and begins again to mine the leaves. It retains its old case and adds to it in the same way as before, but as the additions are larger the process may be watched without a lens. About the end of May or middle of June, the larva quits the leaves and again fastens its case up in similar situations as it did for hibernation. It then turns round in its case, so that its head is at the distal end, and pupates. In a few weeks the imago appears. I have seen this species living on plants completely covered with dust from the adjacent road, but by means of its case and mine it lives dust free. The case made from *Ballota* leaves carries the rough hairs of this plant, and is adorned along its sides by serrations of the leaf margin. When cut from the softer leaves of *Stachys sylvatica* the case has a more silky appearance. This simple method of case enlargement is adopted by several species. *C. viminetella* and *C. bicolorella* make the first portion of their cases in autumn. This becomes very dark during the winter, and when in spring pieces of fresh leaves are added the contrast is striking. Hence the name of the latter species. The same system, but with a modification, is employed when the larvae feed on long narrow leaves. When in spring *C. ornatipennella* has need to enlarge its case, which at this time somewhat resembles a grain of barley, it does not affix it by the mouth end, but fastens it lengthwise to a grass blade, so that the long edge of the case is in contact with the edge of the blade. It then mines out a long narrow space above the old case and overlapping it at either end. It cuts out the cuticles along the upper margin of this space and fastens them together, finally cutting the ends and thus freeing the new case from the leaf. The old case now lies along the back of the new one and stiffens it. The abundant *C. laricella* feeding on the long needles of larch, uses the same method. *C. potentillae* also lengthens its case in a simple manner. It makes many small mines, and when it leaves a mine it does not simply cut away its case from the silk moorings, as most species do, but cuts out a ring from the epidermis of the leaf lying immediately round the mouth of the case and walks off with the ring attached to the case. That is why the

vacated mines of this species show such a large exit hole. In due time the case becomes elongated by a series of frills. This process is also partly used by *C. paripennella* and *C. fuscocuprella*. When the leaves of the foodplant are very small a method is adopted by means of which the whole leaf is added to the case. I have watched *C. saturatella* enlarging its case in this manner, when it was feeding on the common broom. The larva, case and all, mounts to the tip of a leaf and mines out the apical portion, it then splits the leaf down the centre and forces its case wedge-like into the gap where it is firmly fixed with silk. The portion of the leaf lying below the case is now mined out, and this basal part of the leaf now becomes the additional habitable portion of the case. Finally the leaf now incorporated in the case is severed from the plant. Another interesting species to watch is *C. albitarsella*. It may be found under hedges, usually on Ground Ivy, *Glechoma hederacea*, especially where this plant grows beneath a patch of stinging nettles. The finished case is long and slightly curved and at first sight it appears to be made entirely of black silk. I have seen the larva enlarging its case when the latter was about half its final size. It first spun the mouth of the case to the extreme margin of a *Glechoma* leaf and then mined out a comparatively small quadrate portion. After having cut and fastened together the cuticles on each side where the edges of the mine ran in continuation with the length of the case, it cut away the cuticles at the edge of the mine lying opposite the mouth, thus freeing the case from the leaf. In this way the case is lengthened. Later the larva lines the additional piece. So far the process has been that of *C. lineolea*, but as the larva grows it has to increase the bulk of its case. To do this it cuts open the case along the ventral portion and extends the edges with spinings of silk along them to the required depth. At first this silk is white but later it becomes dark like the rest of the case. If we examine the long case when finished, we shall see that it consists of a silken sheath strengthened by leaf cuticle lying saddle-wise over the upper part. The cuticle is recognisable because it still carries the epidermal hairs of the plant. The initial case of this species is cut out of the lamina of the leaf and the whole process of lengthening and widening the case takes place several times during the larval life. Most of the above mentioned species are content with one case and, after the first change of skin in the mine, cut a case out of the lamina of the leaf, but *C. juncicolella*, when feeding on *Calluna*, eats out the whole interior of a leaf to form its first case. The subsequent changes of skin always take place within the case, and it is often after a change that the case is enlarged. I think the Coleophorid has five larval stadia. The only way to settle the point is to rear them from the egg and notice particularly when the larva ceases feeding for a day or two. This usually means a moult and after the larva has moved its case again I have sometimes found the old head and skin on the spot where the case rested.

We now come to those species whose habit it is to make more than one case during their larval life. *C. fuscadinella* is a species easily obtainable on birch which is a good food to rear it on. The larva after changing its first skin in its first mine cuts out a minute case. Its method is more simple and quicker than the leisurely one of *C. lineolea*. It slits the upper and lower cuticles of the mine in a curved line and spins the inner edges of the cuticles together. It repeats the

process on the other side of the mine. At this stage the larva lies between the joined cuticles which are already cut free of the mine, except at the extremities of the curved lines. Lastly the larva cuts the case free and walks off, very soon spinning it to the underside of a leaf in order to take a meal. I believe this method is adopted by most of the Coleophorid leaf-miners when forming their initial cases. This minute case soon becomes too small, so the larva has to enlarge it and it is interesting to find that it adopts the same system as that described when mentioning *C. potentillae*, namely by adding rings to the mouth, but it is not content with this process alone. It also cuts open the case along the venter and extends the severed margins with silk and reunites them, as described above when treating of *C. albitarsella*. The use of these methods of case enlargement by species belonging to three separate groups points to a community of descent, however widely the species may now be separated. After some weeks the case becomes so enlarged that the original one, cut out of the leaf, simply appears as a black patch on the back of it. With the case in this condition the larva passes the winter usually attached to a twig just above a leaf bud. When in early spring the larva begins to feed again and grows, it continues to enlarge its case in the same manner and in a few weeks the old almost black winter case contrasts strongly with the pale additions of the spring. When the leaves of the foodplant have grown sufficiently firm, the larva, differing from all those previously described, makes an entirely new case. It spins its old case to the base of a leaf close to the margin and eats out the cellular tissue in a straight line along the margin of the leaf, forming a space about twice the length and double the width of its own body. To do this it must of course come quite outside its old case, which it now abandons for good. When this mine is finished, the larva cuts slits in both cuticles along the edge of the mine lying nearest the mid rib of the leaf from base to apex. It then spins the two severed cuticles firmly together. The new case is now a sheath composed of two walls and is still attached to the leaf at the base and apex. The larva is inside this and now it mounts to the apex and severs the two cuticles there but does not unite them. It then returns to the base of the case and treats that in the same manner, clinging to the leaf with its thoracic legs as it finally cuts the case free from the leaf. It then crawls away. After a day or two it completes the case by rounding the mouth, forming three valves at the apex and by lining the interior. The case now resembles in shape that described for *C. caespitiella* but otherwise it is totally different. The leaf from which the case has been made now shows a comparatively large piece missing from the margin and the little abandoned case fastened near the base. In May we can often find leaves so treated on birch, elm and alder. Similarly treated leaves on oak will show the work of *C. lutipennella* and those on hawthorn that of *C. nigricella*, or more rarely that of *C. hemerobiella*, the last may be recognised by the very long curved tube of the abandoned case. A few species are not content with two cases but certainly form three and I believe the closely allied species, *C. gryphipennella* and *C. siccifolia*, make four cases. I have had eggs and first cases of the former but have not carried it through its life cycle. It hibernates as a young larva. I know that *C. siccifolia* makes three cases, but the smallest cases, I have found, appear to be too large to be the initial cases, so I

believe it must make four cases. The last case in which it hibernates fully grown is well known. It is the usual cylinder but with a very large piece of leaf curling over it. On this account it has been described by the libellous name of the "clumsy tailor"; I consider it as one of the cleverest cases. If we examine a whitethorn hedge in winter or early spring we shall see many old shrivelled leaves still adhering to the twigs, not in their natural positions, but caught in the forks of the twigs in the interior of the hedge. If *C. siccifolia* is an inhabitant of the hedge, some of these apparently merely shrivelled leaves will contain the well hidden hibernating larva.

*C. limosipennella* is a third species which certainly makes three cases. This and *C. badiipennella*, instead of forming three valves at the apical ends of their cases, are content with two only and the same may be said of most of the species which spin their cases entirely of silk.

*C. limosipennella* cuts its cases out of the leaf margin just as *C. fuscedinella* does its final case and *C. badiipennella* makes its final case also in the same way. This method is nearly the most rapid and labour saving as only one side of the case requires fastening together. *C. salicorniae* is said to form its case of a hollowed stem of its foodplant which may require even less labour. The most independent way of forming a case is that adopted by those species which build the so-called pistol cases. In 1920 I was lucky enough to obtain eggs from a captured ♀ of *C. ibipennella*, Stt. (non Zeller). These were laid on the leaves of birch and I was able to watch how the larvae commenced to form their cases. The method employed is utterly different from any of the foregoing. The larva begins to mine in the usual manner, and after a day or two cuts a round hole out of the lower cuticle of the mine. Over this hole it forms a dome-shaped structure of its own silk mixed with the debris from the hole and with its own black excrement. From time to time it adds silk and excrement to the dome which in a day or so takes the appearance of a microscopical thimble thickly covered with black dots. The larva now gets inside the thimble, cuts it free of the leaf and crawls off to make a fresh mine. To enlarge and perfect its case, it now uses silk only and by frequent spinings it finally forms a miniature black pistol case. In this it hibernates and in spring, as the larva grows, it lengthens its case by spinning at the mouth and widens it, I believe, by cutting it down the venter and extending the margin. These operations appear always to take place during the dark. These black pistol cases are conspicuous, but when resting on the leaves of trees they may be mistaken for birds' droppings, or when on low herbage the long cases may be passed over as leguminous pods, which are often black when the seeds are ripe. The most remarkable of them is that of *C. palliatella*. The posterior portion of this case is almost enveloped in a mass of beautiful fan-shaped scales all elaborately spun of silk. After hibernation these pistol case makers show a freedom of habit. That is they are not all tied down to the mining habit. Stainton's *C. ibipennella* and *C. anatipennella* will eat the whole of the upper surface of a leaf making a kind of lattice work between the veins, while the latter species may be found on the top of a shoot of blackthorn eating the young leaves entirely as a Noctuid larva would do. Another species, which I believe is still undescribed, is fond of making its spring meals off the male catkins of birch. The larvae of Coleophorids do not thrive in closed

boxes as so many micro-larvae do, they require plenty of air. I use Stainton's method. Sprays of the foodplant are placed in a bottle with water which is plugged with cotton wool and the whole surrounded by a glass cylinder covered with gauze at the top. Care must be taken that the plant does not touch the cage otherwise the larva will crawl to the top and wander aimlessly. It then has to be replaced on the plant. If the case is held between the thumb and finger the larva will come partly out, it should then be held to the plant till it has taken hold. This operation requires a little patience because the Coleophorid, like many small larvae, nearly always spins a ladder of silk in its progress. Burdened by its case it requires a firm foothold which the ladder provides, and one has to wait till the first two or three rungs have been spun. The best opportunity for studying the habits of this family is afforded, when we find the species in the garden or in some handy place where we may observe them frequently in their natural habitat without disturbing them. In these observations on the cases I have endeavoured to show that each species has its own particular method of forming its case or cases, and that the members of a group of species usually form their cases on the same principle. Each larva has in it the inherited architectural instinct peculiar to its species. The case is the expression of this instinct and I maintain that by the study of the cases and especially of the methods employed in the actual building of them, we gain an insight, not only into the descent of species, but also into the lines of that descent. Though it would be absurd to attempt to classify the genus by the cases alone, I feel sure, that in working out the inner phylogeny of the genus the cases must be taken into consideration. I feel convinced that, for example, a species like *C. lineolea*, which forms its case of vegetable matter could never have arisen from a species like *C. anatipennella*, which spins a case entirely of silk. On the other hand we may get an idea as to how the black silk pistol case arose from the vegetable case. Let us take *C. albitarsella*, which is intermediate between the two extremes; it lengthens its case just as *C. lineolea* does, but it increases the depth of its case exactly as *C. anatipennella*. In this case the vegetable portion is even now of small account, and we can conceive that in time the larva might neglect this, and spin its case entirely of silk.

(To be continued.)

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### Preliminary Observations on the British Vanessaes.

By HAROLD B. WILLIAMS, LL.B., F.E.S.

(A Paper read before the London Natural History Society, April 17th, 1923.)

(Continued from page 95.)

#### 1. Progressive variation of *Aglais urticae*.

There are a number of features in the variation of *A. urticae* in which a transition in the direction of the markings of *V. io* is observable. Foremost among these I may mention the obsolescence of the "puncta" in many forms (*ichnusoides*, Selys, etc.) and the obsolescence of the "nota" in others. I have, apart from extreme forms, an example without trace of "puncta," and one with only faint traces of the "nota," both specimens otherwise normal. I believe Mr.

Shaw has an example with the "nota" entirely absent. These two forms concern the forewings only. The remaining forms to be discussed concern both wings.

The blue marginal "guttae" and "lunulae" are frequently partially obsolete, and in such cases the apical lunules tend more strongly to survive than the anal, thus leaving those which, as I shall show later, are modified into the ocelli in *V. io*.

In conjunction with the obsolescence of "puncta" and coalescence of "maculae" on the forewings, a certain amount of suffusion of the hindwings, either in the form of darkening of the veins, or of a general suffusion occurs. In such forms it is common to note that the darkest part of the wing occurs in precisely the area in which the hindwing ocellus is produced in *V. io*.

These "progressive" forms culminate in two aberrations described and figured by Reuss (*Ent. Rec.*, xxi., p. 83) as ab. *ioformis*, and ab. *ioprotoformis*, in which there are distinct ocelliform markings on both fore and hindwings. Reference should be made to the figures of these truly remarkable aberrations in Plate vii., of the volume of the *Ent. Rec.* cited.

In ab. *ioformis* the "nota" and first costal "macula" of the forewings are normal, the remainder of the markings being progressive or aberrational. The coalescence of the 2nd and 3rd costal "maculae" may be regarded as aberrational and possibly, having regard to its frequency in other forms of *A. urticae*, the obsolescence of the "puncta" also. The most remarkable feature of the form, however, is the distinct ocelliform marking at the apex of the forewings, formed by metallic white spots, the lower two of which are shaded with violet by the marginal markings. The hindwing is shaded with *io* colour as in *V. io*, and where the ocellus should form is a black area, with lighter areas opposite the three blue marginal spots. The blue marginal spots in the tornal areas of both wings tend to obsolescence. (See also *Entom.*, xliii., p. 55, figure).

Ab. *ioprotoformis* is perhaps even more remarkable. It is a more extreme aberration. In the forewing all three costal "maculae" coalesce. The "nota" and "puncta" are obsolete, the ocelliform markings in the forewings are more pronounced, and the hindwing characters of ab. *ioformis* are more pronounced. The insect, in fact, quite closely resembles an extreme specimen of *V. io* ab. *belisaria*. Reuss' articles in *Entom.*, xliii., and *Ent. Rec.*, xxi., give further details of these forms.

The suggested wild captured hybrids between *A. urticae* and *Pyrameis atalanta* are probably further instances of this sort of variation. (Vide *Entom.*, vol. xliii., p. 84).

*A. urticae* ab. *polaris* may be another, and I have prepared drawings of this form compared with *Aglais milberti*, to illustrate the suggestion. Cf. also *A. urticae* ab. *fulvomarginata*, Rnr.

## 2. Atavistic variation in *Vanessa io*.

Normal British *V. io* have at the apex of the forewings a black margin, with distinct blue spots, as in *A. urticae*. This is occasionally extended (as in ab. *antigone*) so that these spots spread out and form an

unbroken blue band. Such forms are more usual on the continent and are induced by a warmer temperature. In their further development they are probably progressive, in the direction of ab. *belisaria*, as our insular form is, in its most pronounced instances, transitional to ab. *fischeri*. Ab. *fischeri*, with its disintegrated ocellus, is perhaps one of the most striking forms of *V. io*. In the extreme form (vide *Entom.*, vol. xlii., p. 311) not only is the ocellus disintegrated, but there is also developed a complete chain of blue lunules in the black outer marginal band, a further fact indicating, in my view, a line of variation in the direction of *A. urticae*, or at least of a "tortoiseshell" species. Traces of such lunules occur with some frequency in the form of a series of intense black spots in the margin, and I have a series bred from Chalfont larvae in 1912.

The hindwing ocellus of *V. io* is, I think, in reality composed of three coalesced lunules. The development of a fourth (ab. *cyanostricta*, Rnr.) is not unusual, and I believe the appearance of a fifth has been recorded, these forms indicating, I think, variation in the direction of a reversion to a chain of blue lunules as in *A. urticae*. The obsolescence of the blue markings (Fig. 15 in Frohawk's plate) results in a form which should be compared with *A. urticae* ab. *ioformis* and other hindwing aberrations of that species.

Other examples of variation of *V. io* in a tortoiseshell direction must be dealt with more shortly for the present. I may instance the occasional development of a "nota." The occurrence of "puncta" is unknown to me, and I must for the moment content myself with observing that at precisely the place where these spots would occur, if present, there are two white spots, the lower two of the chain of white spots passing across the wing. This is undoubtedly a significant fact, but for the present I should prefer to express no opinion as to whether it is material to the subject under discussion.

Before leaving this subject of variation I desire to guard myself against being supposed to have said that *Vanessa io* has developed, by progressive mutation or otherwise, from *Aglais urticae*. I regard it as a somewhat more specialised species and I regard the "tortoiseshell" facies, particularly as displayed in such species as *Eugonia polychloros*, as suggestive of the primitive markings of this group of Vanessids, and I regard *Aglais* as nearer to *Vanessa (io)* than *Eugonia*, but I go no further.

To *Euvanessa antiopa* and the Pyramid species I have made no particular reference. The relationships of these insects to the species I have discussed seem to me to raise questions of the greatest difficulty, and I hope after deeper study to endeavour to interest you in a discussion of some of the points involved.

Here for the moment I propose to leave these subjects in the hope that what I have written may interest others in the two problems I have put before you. The first is a problem for the field-naturalist, the second for the scientific student, and I trust that before I write again on this group material contributions to the solution of both will have been made.

(To be continued.)

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## Notes on the Psychides.

By REV. C. R. N. BURROWS, F.E.S.

*(Continued from page 84.)*

So far it will be seen that I have confined my notes to the difficulties, which I have met with in my quest for the names of the *Psychides* which have come into my hands. It will be quite obvious that as a pioneer on a new road, I have been obliged to depend largely upon those who have already partly explored the road, or its approaches. I have been compelled to argue from the known to the unknown, trying thus to recognise the species from the point of view of those who have gone before me. Venation, antennal, and tibial, measurements, are really outside my intended path. I have examined the last subject somewhat minutely, as it is the one detail which I find comparatively easy to study. Venation I find out of my reach, and the antennae of these small insects are so often lost, and if not lost imperfect (especially in old specimens), that very little can be learnt from them.

There still remain the question how far these particulars are constant. Chapman writes regarding venation (Tutt, *Brit. Lep.*, II., p. 121) "Psychides are, speaking paradoxically, especially homogeneous in exhibiting the most remarkable vagaries in their neuration." The same fact is emphasised in the instance of specimens of *Thyridopteryx ephemeriformis* in the British Museum Coll. (Tutt, l.c., pp. 373, 375) and and in the specimen of *Masonia crassiorella* preserved, and mounted, by Chapman, which has the "cellula intrusa" on one, and not upon the corresponding wing (Tutt, l.c., p. 306, note and plate, fig. 7). Bruand figures a similar specimen. Mr. F. M. Jones, of Wilmington, U.S.A., has sent to me the following note, which is embodied in his paper published in the *Entom. News*, Academy of Natural Sciences, Philadelphia, for April, 1923.

"In my attempts to separate *Thyridopteryx vernalis*, Jones, from *T. ephemeriformis*, I have studied 50 specimens of the latter from different localities, and foodplants, and tabulated the range of variation exhibited, especially in the venation. The result is that I find if I make a composite drawing from the 50, to exhibit the maximum venation, I have a 14-8 veined insect and if I make a similar composite to show the minimum venation exhibited by the 50 insects, I have a 9-5 veined insect, and the extremes in any character are exhibited by the opposite wings of individual insects, so that they are not conceivably of specific value."

This is the sort of investigation which is imperative, in my opinion, before we give importance to any single feature. One is compelled to question whether, if examination were made of a sufficient number of specimens, the venation evidence would be as strong as is supposed, and whether this inconsistency is confined to the *Psychides*. It appears to me to be much the same thing with the antennae. Where the structure is obviously different, I do not question the evidence, but I do feel doubts where the size, number of joints, and such details are concerned, so long as there has been no sufficient numerical examination of specimens.

I must now proceed to record the results of my examinations of the final segments of the males of the group. Here I am without help, and my observations will of necessity be more or less crude, perhaps

one-sided. The anal appendages in the *Psychides* are remarkably distinct from those of all other Lepidoptera known to me, and I do not boast idly, when I say that I have a fair knowledge of all the larger divisions. This difference is quite sufficient to support the opinion (based, of course, on entirely different grounds) of Chapman (*Ent. Record*, XI., p. 200) and Tutt (*Entom. Record*, l.c., p. 149, *British Lepidoptera*, vol. l.c., p. 121 et seq) following Guénee, Bruand, Packard, Spüler, and others, that they form a distinct homogeneous superfamily, in disagreement with the many, Linné, Stainton, Meyrick, Barrett, etc., who have split them, and assigned the parts to widely separated positions. I do not myself propose therefore to define any boundary between the so-called Macro- and Micro-Psychides, the differences which I discover being no greater than one observes in other groups of the Lepidoptera, in many cases much less. I am able after due study to affirm that every suggested alliance with other groups of Lepidoptera which has come to my knowledge is at present fallacious, the "missing link" being so far undiscoverable, and I shall hope to prove this later on. I have attempted to formulate a diagnosis of the group, based upon the genitalia, and find that the points of difference from the rest of the Lepidoptera are largely negative. The genitalia are of the simplest, except for the development in a large portion of the species, of the seventh and eighth segments. Some such scheme as follows may be taken as roughly covering the whole group.

PSYCHIDES.—MALE.—Extremity of the tenth segment dorsally rounded, without extensive final projection, though rarely somewhat produced medially, sometimes bifid, and generally slightly folded inwardly, toward the apex, on either side of the central line. The valves are quite simple, without armature, baglike, the valve and its sacculus forming one bag, separated only towards the extremity of the sacculus, which is seldom harder than the rest of the valve, except at the tip. The sacculus is sometimes only slightly extended, but generally well developed, even greatly so. Centrally of the two final segments as viewed from below, *i.e.*, between, and connected with the bases of the valves, are, almost invariably, two inflated cushions, "pulvilli," embracing the anellus laterally, perhaps constituting it. This feature is as far as I know, quite peculiar to the *Psychides*, and there is no suggested ally of the group which possesses it.

There are no "cornuti," at the most the ductus ejaculatorius is lined with fine spines. Except in the smaller and more delicate species each segment of the abdomen bears a well defined plate dorsally and sternally (tergite and sternite), which may be simply quadrate, divided centrally into two parts, or even more highly modified or reduced in size. The forward edge of the eighth sternite in a large part of the group bears a pair of well-developed rods, sometimes greatly lengthened, directed forwards, and enclosed within the preceding segment or segments, and the rods are in some cases enveloped in separate sleeves, within the seventh segment. These rods are in a considerable section (chiefly exotic) modified into a large plate, divided into arms upon the forward edge. In many cases of the larger species, especially those which possess these rods, the eighth segment is completely covered, and the seventh encircled by a band of closely placed coarse hairs or spines. FEMALES.—The females of the *Psychides*,

except in a few species, are either entirely apterous, or possess merely rudimentary wings.

The rods in these insects call for special notice. Chapman in his paper "Notes on the habits and structure of *Acanthopsyche opacella*, H.-Sch. (*Trans. Entom. Soc. Lon.*, 1900, part iii., p. 403) supplies an excellent description of the method of copulation in this species, which possesses the rods. The accompanying plate\* shows the extensible powers of the male abdomen, and the necessity for this, since it has to reach the far end of the pupal shell, in order to affect his purpose.

The rods give him power to bend and direct the extremity of his body. It will be evident that these rods exactly correspond with the ovipositor rods of female Lepidoptera in general, and serve the same purpose, which is allowing the end of the abdomen to be curved (Tutt, p. 115). In these instances the female Psychid would appear, at least in some species to remain in the pupal shell, but to force off the head cover to provide an entrance. Of this I have no personal knowledge. I have, however, found the perfect females within the exceptionally hard dry pupal shells of such species, whenever I have examined them.† I should expect considerable differences in the length and form of these rods to indicate modifications in the necessities of the case, and when the rods are replaced by plates, that the pairing habit would be somewhat different. But these suggestions are mere conjecture, and can only be verified by the careful study of the living insects, which it is out of my power to make.

I have tried in the plate which accompanies this paper, to indicate the chief forms of the Psychid genitalia which have come under my notice. I do not profess that the material which has reached me is in any way sufficient. I hesitate therefore in pushing my conclusions too far, as it is quite certain that there are many more forms to be examined, or even discovered. So far as Europe is concerned, I have reason to think that I have secured the majority of the species, but of exotic forms there remains much to be learned. I have then chosen types of formation to begin with, in order that I may present some suggestions to guide such as follow me. The names attached to these figures may be taken as probably correct, all having been as far as possible identified.

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\* I found among Dr. Chapman's material the identical individuals from which the drawing was made, and have deposited them at the British Museum (Natural History).

† A striking confirmation of this fact has recently come to my notice. I received from Mr. P. A. Buxton a female case of *Amicta quadrangularis*, Christ., collected near Jericho, November, 1922. When it arrived, on March 21st of this year, curiosity prompted me to open it. I found within, the hard pupal shell with the head broken open, and the interior packed with the large soft eggs of the insect, still unhatched. The female has evidently never left the pupal shell, though her presence in an empty and collapsed condition is not evident. I am sorry to say that these eggs appear to be infertile, proving, almost conclusively, that the individual had been transported, by some means, from the locality in which it occurs, to a locality where it does not occur.

(To be continued.)

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## Notes on Paraneuroptera for 1922. (Eastleigh, etc.)

By FREDK. J. KILLINGTON, A.C.P.

This has not been a good year on the whole for Dragonflies, although on some fine days certain species were in abundance, notably *Agrion mercuriale*, Charp., *Calopteryx splendens*, Harris, *C. aenea*, Linn., and *Brachytron hafniense*, Müll.

The first dragonflies seen were two teneral specimens of *Pyrrosoma nymphula*, Sülzer (May 8th), but these were not taken, and it was not until May 21st that the species was well out, although still mostly in teneral condition. The last capture of the season was on September 16th when *Ischnura elegans* var. *infuscans*, Campion, was captured.

*Cordulegaster annulatus*, Latr.—Very few of this fine insect have been seen this year. Among alders by the Beaulieu River in the New Forest I noticed a pair "in cop." (June 5th).

*Brachytron hafniense*, Müll.—Large numbers of this dragonfly were seen on June 12th, at a large pond near Eastleigh, but most of those taken were badly damaged.

*Aeschna mixta*, Latr.—A specimen of this species was seen at rest, just out of reach but near enough for identification, at a pond here on September 2nd. A male was picked off a bramble twig in a brickfield at Southampton on September 9th. Mr. H. Campion informed me (September 21st, 1922), that a specimen was knocked down by a builder with a trowel in the grounds of the British Museum (Nat. Hist.).

*A. cyanea*, Müll.—This species has not been plentiful here this year, the first specimens were taken on August 5th, and the last on September 2nd.

*Anax imperator*, Leach.—This species was fairly common here on June 12th, and a pair "in cop." were netted as they drifted low over the grass at the pond side; the female was much damaged.

*Cordulia aenea*, Linn.—A species which seems to have been common this season. On June 1st a specimen was brought to me for identification taken at Botley (near Fareham), and several were taken near Lyndhurst on the same day. On June 5th I counted 20 in the latter spot, and noted a pair, united "hoop-fashion," drift swiftly out of sight over the tree tops. Two pairs were seen to act in the same manner at Eastleigh, on June 12th, where the species was in extraordinary numbers.

*Libellula quadrimaculata*, Linn.—It was first noticed on May 24th, at Beaulieu, and the last was taken at Eastleigh on June 12th. On June 3rd, it was observed pairing and ovipositing.

*L. depressa*, Linn.—This species was noted on several days, near Eastleigh, between May 28th and June 12th, and was seen pairing and ovipositing on June 3rd.

*O. coerulescens*, Fab.—One very teneral male was taken at Beaulieu on June 5th, but I had no further opportunity to notice the species. The male taken, in spite of its very immature condition showed faint traces of blue colouring.

*Sympetrum striolatum*, Charp.—This species was noticed first on August 5th, at a shallow woodland pond at Chandler's Ford. The day was very dull with rain threatening all the time, but imagines were emerging from their brown stumpy larval-skins in numbers. Empty larval-skins could be seen clinging in various situations: some clasping

reeds, others clinging to the rough surface of a wall that holds in the water on one side, and others, again, were hanging to rotting tree stumps and boughs projecting from the surface of the pond. A few newly-emerged imagines were trying their wings in flight despite the sun's absence. The species was common on Southampton Common, and in late August specimens were noted flying over the Winchester Downs.

*Calopteryx virgo*, Linn.—This species was fairly plentiful in the New Forest on June 1st and 5th.

*C. splendens*, Harris.—An exceptionally abundant dragonfly at Eastleigh and at Alton in 1922. On May 21st, the first specimen, a teneral male, was seen at Eastleigh by the R. Itchen. The following day numbers were emerging, the empty larval-skins dotting the vegetation on the riverside. The species continues on the wing for at least half an hour after sunset. By May 28th the insects were frequently seen pairing, and while copulation took place the pairs rested among the grasses. One pair I managed to secure, and by quickly killing the male, prevented their separation. The superior appendages of the male were noticed to grip over the hind ridge of the prothorax of the female, while the inferior ones held the front of the female's prothorax; there was a very noticeable resistance when an attempt was made to separate the specimens. On May 28th a female was taken devouring a caddis-fly. The tow-path by the R. Itchen was, by this date, littered with hundreds of wings of this species, but I failed to see any bird attack the insects, and a water-keeper who expressed astonishment at the sight failed to find out what was responsible for the massacre. My suspicions rested on the large number of cuckoos that haunt the locality, but I could gain no definite proof. Numbers of the dragonfly were also noticed in spiders' webs. So common was this beautiful insect that in a square yard of meadow, on June 10th, I counted 33 males resting. On June 12th a specimen was taken with larval water-mites resting on the underside of the thorax. In spite of the wretched weather a few specimens were still about on July 31st.

*Ischnura elegans*, Vander.—This was another common dragonfly in 1922, and was first seen on May 31st at Eastleigh. On June 10th var. *rufescens*, Steph., was taken by the R. Itchen, and again on June 12th at a woodland pool here. A specimen, taken on the latter date, had a larval water-mite on the underside of the thorax, and several along the mid-ventral line of the abdomen. On the same day a number of specimens of the female were taken of two distinct forms. Some of the specimens were of a lovely bright violet colour in place of the usual blue on the head, thorax, and first two abdominal segments, a colour sometimes found on miniature Agrionid dragonflies, but a few of these violet forms seemed so immature that I came to the conclusion that they constituted a good mature variety. I have since discovered, through the kindness of Mr. H. Campion, that both Roster and De Selys named a violet form of the female of *I. elegans*. As to his var. ♀ *evigua*, while admitting that it corresponds in colour with the immature form, Roster states that the immature coloration sometimes persists throughout life. Referring to var. *violacea*, Selys., Schirmer speaks of it as "ausfärbungsform," without qualification (*Arch. Naturgesch.*, Berlin, LXXIX., A. 2, p. 31, 1913).

The other colour form referred to above has the normal blue replaced by a fresh grass-green colour. My specimens of this form unfortunately met with an accident, and I am not in a position, therefore, to say much about them, except that the form was not uncommon, and some of the specimens undoubtedly immature. As var. *infuscans*, Campion, occurs here (the last *I. elegans* taken in 1922 was a specimen of this form on September 16th), it is quite possible that the insects I took were immature specimens of this variety.

*Agrion pulchellum*, Vander.—Only one specimen of this insect, a female, was taken here on May 28th.

*A. mercuriale*, Charp.—This species was common this year in its restricted locality. It appeared, suddenly, on May 30th, in good numbers, males and females being equally abundant. Empty larval-skins were obtained as the specimens emerged. The short caudal lamellae, 3 mm.-3.25 mm., are obviously characteristic of the species, which breeds here in a swift-flowing part of the R. Itchen. On June 10th males and females were noticed "in cop." A number of males were taken with aberrant markings on segment 2 of the abdomen: specimens with the two horns of the "Mercury" mark detached were fairly common; on June 1st a specimen was captured with only the right horn detached, and on the 10th another male had only the right horn detached.

*A. puella*, Linn.—Noted first on May 28th; and on the 31st specimens were pairing. Very few specimens of this little dragonfly were seen in the New Forest on June 1st, or on the 5th, but on the 12th many pairs of the insect were seen at Eastleigh, and an interesting variety of the female was taken "in cop." with a typical male. In this aberrant female the blue colouring of segments 4, 5, and 6, occupies quite a third of each segment and is not bisected by a black mid-dorsal line, and on segments 3 (bisected by a black line) and 7 (almost bisected) is larger than normal.

*Pyrhosoma nymphula*, Sülz.—I have already mentioned that this species was the first seen in 1922 (May 8th), but it was not until May 21st that the species was well out, although still for the most part in teneral condition. On the 22nd a teneral pair were taken "in cop.," and it was obvious that the female had only emerged that morning. In the New Forest, on the 24th, the dragonfly was plentiful. On May 25th, at 11 a.m., a specimen was noticed by the R. Itchen emerging from its pupal skin. On May 30th two var. *melanotum*, Selys., were taken here, one being of a very extreme form; the same variety was also taken in the New Forest on June 5th. Several females were watched, on May 31st, as they were ovipositing, their abdomens and wings being completely under the water. On two occasions I took this dragonfly with prey: at Eastleigh (May 29th) a specimen was taken with the Alder-Fly, *Sialis lutaria*, Linn., and at Beaulieu, in the New Forest, another was taken (June 5th) with the Lacewing, *Chrysopa perla*.

*Enallagma cyathigerum*, Charp.—This dragonfly was in teneral condition on Southampton Common on May 14th, and was plentiful at Eastleigh by June 12th.

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## List of Orthoptera and Neuroptera collected in the Eastern Pyrenees, with ecological notes.

By HUGH SCOTT, M.A., Sc.D., F.E.S.

The Orthoptera and Neuroptera enumerated below were taken in the immediate vicinity of Vernet-les-Bains, Pyrénées-Orientales, France, between August 17th and September 7th, 1922. The Orthoptera were all named at the British Museum by Mr. B. P. Uvarov, and the Neuroptera by Mr. C. L. Withycombe. Mr. Uvarov has also read the manuscript and made several suggestions, which I have followed. I am greatly indebted to these colleagues, without whose kind help this article could not have been written. Although my lists contain nothing new or very striking, they are here placed on record as pertaining to an area which, though circumscribed, nevertheless contains several very different types of country, and also because careful notes of habitat were in many cases made.

The eastern extremity of the Pyrenees differs considerably in climate, fauna, and flora from other parts of those mountains, a Mediterranean type prevailing to a large extent. But Vernet is probably too well-known a collecting-ground to require much description. The following remarks may, however, not be out of place.

Vernet lies some way to the north-west of Mont Canigou, in the higher part of a side-valley which falls away northwards to join the valley of the river Tet. The ridges in the immediate vicinity are some of the outlying spurs of the great complex of the Canigou. The village of Vernet is at an elevation between about 2000 and a little over 2200 feet above sea-level (620-680 metres). The specimens were all taken within a few miles of Vernet, at points between 2000 and a little over 3000 feet. My whole time was not devoted to collecting, and circumstances prevented expeditions being made to higher elevations up the Canigou, which rises to 9,137 feet.

This limited area, however, contained several distinct types of country. The season was well advanced, and great, sometimes intense, heat\* prevailed up till August 28th, after which the weather was often windy and cool and sometimes wet. Despite the heat, the valleys, irrigated by mountain-streams, were intensely green, and a late crop of hay was being scythed in the little meadows or under the apple-trees in the numerous orchards. In marked contrast were the brown, treeless, sun-scorched hills to the north, especially certain ridges to the north-east in the direction of the village of Fillols; these hills were covered in places with dead brown grass, while in other parts acres of ground are occupied by gum-cistus bushes, between which lie bare stony patches. Most plants on these hillsides had gone to seed, but some, such as lavender, larkspurs, and the blue-flowered Composite *Catananche* were still blossoming. Other and moister slopes were clothed with greener grass, dotted with bushes of broom.† Lastly,

\* Part of a great heat-wave (accompanied by forest-fires) which embraced much of Southern France, though conditions further north were very unsettled and wet.

† Several species of *Satyrus* occurred in numbers on these open hillsides, and appeared to be somewhat localised. Besides *S. semele*, many worn examples of *S. briseis*, L., were seen on one hill, while many fresh specimens of *S. fidia*, L., and *S. stalinus*, Hufl., frequented very stony and dry places.

the woods, which in different places took the form either of a scrubby copse-growth of chestnuts (*Castanea*) or deciduous oaks, or small trees of evergreen oak; or, on the higher parts of some steep ridges were composed of pines, between which flourished a tall luxuriant vegetation of ling (*Calluna*), sometimes mingled with occasional junipers, brooms, cistus, etc. Late-summer flowers were abundant along roadsides and in waste-places; *Saponaria*, *Fryngium*, *Echinops*, *Eupatorium* and others, and, in wet spots, tall clumps of a kind of mint round which, during the first ten days at least, congregated great numbers of a small *Epinephela* (? *E. tithonus*). This much being said by way of introduction, one may proceed to the list of captures.

### ORTHOPTERA.

In the following list the distribution of each species in other parts of France is usually briefly indicated, and sometimes the entire range of the species as well. This information is nearly all taken from Dr. L. Chopard's "Orthoptères et Dermaptères" in the *Faune de France* series, Paris, 1922.

Two local lists of particular districts within the department of Pyrénées-Orientales have also been consulted. The first, by Xamheu, forms part of a "Faune Entomologique des Pyrénées-Orientales," and appeared in *L'Echange*, XXIV., no. 283, July, 1908, pp. 204-208 (special pagination). The centre of his district was Ria, a village a few miles north of Vernet in the valley of the Tet, and his radius of collecting included all types of country from the valley itself, with its vineyards and maize-fields, up to an elevation of over 7800 ft. (2400 metres) on the Canigou.\* His list therefore cannot be very closely compared with the fauna of a restricted area such as I worked. It consists of 34 species in all, 5 Dermaptera, 2 Blattidae, 3 Mantidae, 1 Phasmid, 7 Acridiidae, 9 Phasgonuridae, 7 Gryllidae. Only 7 of these species occur also in my list, in which they are marked \*.

The second list is by J. Azam (*Feuille Jeunes Natural.*, ser. 5, vol. 43, no. 509, pp. 84-5, May, 1913) and pertains only to the Vald'Eyne, a small valley at the high elevation of from 1600 to over 2000 metres (roughly, 5000 to nearly 7000 feet), south of Mont Louis and considerably west of Vernet. This list includes 23 species, largely different from those of Xamheu's list, and made up of 1 species of Dermaptera, 1 Blattid, 14 Acridiidae, and 7 Phasgonuridae. 8 of the species have a place also in my list, in which they are marked †.

These two lists and my own, all taken together, amount to 63 species of Orthoptera (and 5 species of Dermaptera)\*\* but this is still very far from a complete enumeration of the Orthoptera of the Eastern Pyrenees. Chopard records many other species from that region, and as he does not always mention departments by name, the list might possibly be even further extended by a perusal of Azam's "Catalogue des Orthoptères de France" (*Misc. Ent.*, IX., 1901) and of scattered papers.

\* See introduction to his "Faune," which appeared with vol. XIX. of *L'Echange* (1903).

\*\* More than double the number considered to be indigenous to the entire British Islands.

**Blattidae.**

1. *Ectobius panzeri*, Steph.—Several specimens.

**Mantidae.**

2. \**Ameles decolor*, (Charp).—One specimen of this small brown Mantid, taken on short turf on a wind-swept treeless "Col" on the ridge south of Fillols, at about 3000 feet or above, 6.IX. Chopard lists, under the distribution in France of this Mediterranean insect, almost all the coastal departments from Alpes-Maritimes to Pyrénées-Orientales, as well as several others in Provence.

3. \**Mantis religiosa*, L.—A number of examples, all of the green form, were seen in certain places, always sitting in broom-brushes; 26.VIII. and later; over 2200 feet. Xamheu records it from elevations up to over 3900 feet. Its very wide distribution (Central and S. Europe, N. Africa, parts of Asia) includes practically all France, even to the extreme northern departments. I am indebted to Charles Aymé, a young grandson of Monsieur René Oberthür, for first taking me to a place where *Mantis* was present in numbers. I did not have the privilege of meeting Mons. Oberthür himself on his own hunting-ground, as he had left Vernet shortly before my arrival, but I received a kind welcome from his daughter, Madame Aymé, and her son.

**Tettigoniidae.**

4. *Tylopsis lilifolia*, F. (*thymifolia*, Pet.).—One ♀, swept from among bracken and broom on some overgrown hillside terraces east of the road to Casteill, 24.VIII., a little over 2000 feet. All the south of France: S. Europe, N. Africa, S.W. Asia.

5. *Phaneroptera quadripunctata*, Br.—Five examples; two ♂♂ and two ♀♀ were swept from bracken and broom at exactly the same place and time as the specimen of *Tylopsis* recorded above. In the region of Périgord it is recorded as common, along with *P. falcata*, in woods of oak and chestnut.\* In France, mainly southern, but also recorded from some departments much further north, such as Maine-et-Loire: S. Europe, Asia.

6. *Leptophyes punctatissima*, (Bosc.).—Two ♂♂ and one ♀, swept from undergrowth of tall ling under pines on the summit of a spur at about 3050 feet (929 m.), 23.VIII. All France: Central Europe, Italy.

7. *Tettigonia* [= *Phasgonura*] sp.—I unfortunately neglected to take some examples seen among shrubs beside the road to Casteill, and therefore cannot say if they were *T. viridissimae* or *T. cantans* (Fuessly).

8. *Pholidoptera griseoptera*, (De Geer).—One ♀, from among tall ling (*Calluna*), at exactly the same time and place (about 3050 feet elevation) as the *Leptophyes* recorded above. Chopard gives "all France except, probably, the Mediterranean region": it has, however, quite recently been recorded from the coastal department of Hérault,† though my specimen may constitute a new record for the Pyrénées-Orientales.

\* Grassé, *Bull. Soc. ent. France*, 1923, p. 82.

† Grassé, *loc. cit.*

9. \*†*Metrioptera albopunctata*, (Goeze) (*Platypleis grisea*, Fabr.).—Two ♂♂, two ♀♀; among grass in dry treeless places. All France: Europe, Madeira, Asia Minor.

10. *Metrioptera tessellata*, (Charp.).—Two ♂♂; same places as preceding species. All France except the north and east; Europe, N. Africa.

11. †*Ephippiger cuii*, Bolivar (1877).—Two ♂♂ and three ♀♀, taken from a number seen, exclusively in broom-bushes, on grassy hillsides at about 2500-3000 feet. They have a very shrill song. In France this species is only recorded from the two departments of Pyrénées-Orientales and Hautes-Pyrénées; it is known besides only in Spain. Azan states that the type form is found at the foot of the Canigou, near Vernet-les-Bains, as well as beside the road leading from Axat to Mont Louis, principally at the baths of Carcanières. The variety *jugicola*, Bolivar (1896), occurs only on the hedges which border the pastures of the Val d'Eyne."

### Gryllidae.

12. \**Oecanthus pellucens*, (Scop.).—Four ♂♂, two ♀♀; others were seen: this species was beaten in some numbers from the foliage of woods, especially of scrubby deciduous oak. Xamheu (*op. cit.*) states that it is "very abundant on our hills (coteaux) in July and August, on shrubs." It is recorded from all France south of the Loire, and from a number of departments north of that river. Central and S. Europe, N. Africa, Asia.

13. *Nemobius sylvestris*, (Bosc.).—One ♂, one ♀. All France: Europe, Algeria.

14. \**Liogryllus* [= *Acheta*] *campestris*, L.—One example. Xamheu records it as very common everywhere in his district, "en plaine, en coteau, et en moyenne montagne." It is spread over Europe (including all France), N. Africa, W. Asia.

### Phasmidae.

I obtained none, though several species are reported by Chopard from the department of Pyrénées-Orientales; probably they occur for the most part at lower elevations.

### Acridiidae.

15. *Parapleurus* [= *Mecostethus*] *alliacens*, (Germar).—Four ♂♂, one ♀, from long green grass in a moist meadow above the road to Fillols, 19.VIII. Four of the examples were of the bright green form when alive; one ♂ has now no trace of green, but this may be due to discoloration. All France: Europe, Asia.

16. †*Stenobothrus lineatus*, (Panz.).—Two ♀♀ of this species, which occurs all over France, and has a wide distribution in Europe and N. Asia.

17. †*Omocestus ventralis*, (Zett.) (*rufipes*, Zett.).—Three ♂♂, two ♀♀, the former sex brown, the latter green, as is normal in this species. It occurs all over France: Europe, Algeria, Asia Minor, Siberia.

18. †*Omocestus viridulus*, (L.).—One ♂, one ♀, the former brown, the latter green. All France. Europe, Siberia.

19. *Stauroderus binotatus*, (Charp).—One ♂, from a dry stony hillside dotted with bushes of gum-cistus, 21.VIII. A species with a more limited distribution, recorded only from parts of France (all the departments listed by Chopard are south of Paris; they include most of those on the Biscay coast and some on, or near, the Mediterranean), Spain and Portugal. It has recently been recorded as common in the environs of Périgueux, on ferns and furze (ajones) in woods of chestnut, but as quite absent in woods on calcareous soil.\*

20. *Stauroderus vagans*, (Evers).—One ♂, one ♀, from a dry stony hillside with patches of cistus, 21.VIII. Occurs all over France, but is commoner in the south: Europe, Siberia.

21. †*Stauroderus biguttulus*, (L.) (*bicolor*, Charp).—One of the most abundant grasshoppers; thirteen ♂♂, twelve ♀♀, presenting many variations of colour and markings, brown, reddish-brown, testaceous, and (in one ♂) blackish dorsally, but in no case greenish. The markings render the coloration very cryptic in the dry, stony places, and among the low bushes where all the examples were found: eight ♂♂ and ten ♀♀ were got on the same hillside (above the road to Fillols) with bare stony patches, clumps of cistus and other tufted plants, at the same time as the two preceding species. Occurs all over France: Europe, N. Africa, Asia.

22. *Chorthippus pulvinatus*, (Fisch. Waldh.), subsp. *declivus*, Brisout. —Two ♂, eleven ♀: all from dry places. Seven of the specimens were taken on 21.VIII. from among dead brown grass below the Fillols road. In such a situation the coloration is very cryptic, being (in this series at any rate) the brown of dead grass with dark and pale longitudinal bands, but with a complete absence of transverse bands, or of the speckles and markings, which make the preceding species harmonise with stony ground. It is remarkable that in this particular spot *C. pulvinatus* appeared to be restricted to the less stony areas covered with dead grass, but did not extend on to the more stony, cistus-dotted slopes with little or no grass, where, only a few hundred yards away, *S. biguttulus* was taken in such numbers on the same morning.

Mr. Uvarov writes (in litt.) that the subspecies *declivus* is a western geographical race occurring in France and Spain and extending along the Mediterranean into the Balkan Peninsula, but the typical form only occurs in Eastern Europe, Russia and W. Asia.

23. †*Chorthippus parallelus*, (Zett.).—Two ♂♂, three ♀♀, from moist meadows, one ♂ and one ♀ being taken on 19.VIII. in the same meadow with *Parapleurus alliaceus* and *Mecostethus grossus*. All showed green colour when taken. All France: Europe, N. and W. Asia.

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\* Grassé, *op. cit.*, p. 83. This writer suggests that it may possibly be restricted to plant associations growing on siliceous soil.

## CURRENT NOTES AND SHORT NOTICES.

The last meeting of the Entomological Club was held at "Hodeslea," Eastbourne, on June 9th; Mr. R. Adkin in the chair; Mr. Donisthorpe being the only other member of the club present.

The visitors were Messrs. K. G. Blair, Malcolm Burr, J. E. Collin, H. Willoughby Ellis, E. E. Green, and A. E. Tonge. Mr. Willoughby Ellis was elected a member of the club in the place of the late H. Rowland-Brown, and accepted the post of Hon. Secretary in place of Mr. R. South resigned.

After an early lunch a ramble was taken on the Downs, and an excellent supper was served at 6.30. Some of the party stayed over the week end, and on Sunday an excursion was made to Abbot's Wood, where in spite of the bad weather the Coleopterists of the party made several interesting captures.—H.D.

We regret to learn from a notice in the daily press that Mrs. O. A. Merritt-Hawkes, B.Sc., M.C., etc., well known for her researches in the scientific cross-breeding of *Coccinellidae*, *Lepidoptera* and kindred subjects, was attacked and robbed by a bearded man wearing clogs, who it is alleged tied her to a tree, when collecting in the Vosges, near Gruebville. Motorists attracted by her cries put the man to flight. We sincerely trust that Mrs. Merritt-Hawkes sustained no injury, nor suffered any serious loss.—H.D.

REFERENCES FOR LOCALITIES.—PONTRESINA, *Ent. Rec.*, xix. 43; xx. 193; xxiv. 266; xxvi. 228, 246; xxvii. 107, 165; xxviii. 8, etc. *Ent.*, vii. 77. ENGADINE, *E.M.M.*, xxxiv. 25; xli., 238. *Ent.*, xviii. 307. *Ent. Rec.*, xxvii. 163, 222; xxviii. 62, etc.; xxix. 159. ST. MORITZ, *Ent. Rec.*, xxiv. 87. DAUPHINÉ ALPS, *Ent. Rec.*, xix., 42; xxiv. 96; xxv. 77; xxvi. 219, 220, 250. *Ent.*, xlvii. 8, 244, 281, etc. BRIANÇON, *Ent. Rec.*, xxiv., 97.

We regret to hear that the Rev. Canon Fowler, D.Sc., M.A., President of the Entomological Society of London in 1901-2, died on June 3rd. He will be remembered by his great work, *The Coleoptera of the British Isles*, in 5 vols., to which he added a 6th in conjunction with our colleague, Mr. H. Donisthorpe.

Another entomologist has also passed away, Mr. W. H. Whiffen, a member of the South London Entomological Society since 1887.

In the *Annales de la Soc. ent. de France*, part 4, there is a kindly appreciation of the late H. Rowland-Brown, by M. Chas. Oberthür, who also incidentally refers to our late colleague Dr. T. A. Chapman, calling them both "sincères amis de leurs confrères français."

In the *Rev. Mens. Soc. ent. Namuroise* the form of *Papilio machaon* in which the ocellus at the anal angle of the hindwing is absent, the area being covered by a continuation of the blue coloration, is named as ab. *exocellatus* by M. Cabeau, the reference to the original description being given "Archives Cosmologiques," Bruxelles, 1867.

The *L'Amateur de Papillons* continues to be attractive and useful and we hear that its circulation is satisfactory. The last number issued contains, the Caterpillars found on the Lavender, by M. P. Chétien; the Oviposition of *Chrysophanus dispar* (called *hippotoë*) var. *rutilus*, by M. E. Bnsch; the Hybrid of Algerian Smerinthids, by M. Rotrou; Notes on *Thaumatopoea processionea*, by M. L. de Larminat, etc.

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## SOCIETIES.

### THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

*March 22nd.*—Mr. Walter Burch, 35, Ansdell Road, S.E. 14, was elected a member.

Mr. A. A. W. Buckstone exhibited ab. *nigrotata* of *Pieris brassicae*, from Eltham, an unusually light example of *Anticlea nigrofasciaria*, also a transverse banded form of the same species from Malvern, and an aberration of *Melitaea aurinia*, from near Brighton, having a broad black hindmarginal band, the usual marginal spots being absent.

Col. R. H. Ratray read a paper on "Indian Cuckoos."

*April 12th.*—Mr. P. H. Windsor, "Fern Hill," Horley, was elected a member.

Mr. E. H. Ellis read a paper, with lantern slides, "The Life-history and Structure of Mosses."

*April 26th.*—Messrs. W. G. Nash, "Clavering House," Bedford, and W. S. Brocklehurst, "Grove House," Bedford, were elected members.

Mr. K. G. Blair exhibited the stick-insects *Bacillus rossii* and *B. gallicus* to compare with *Carausius (Divippus) morosus*, and gave the distinguishing characters of the two genera, the former genus has species with short antennae, in *Carausius* they are long.

Mr. Newman, extreme forms of *M. cinxia*, two undersides with black bands, two with a paucity of markings, and two uppersides with the outer two-thirds of the wings devoid of markings.

Mr. H. Moore, Coleoptera from N. Zealand; including the Longicorn *Prionoplus reticularis*, whose huge larva lives in the Kauri-pine.

*May 10th.*—Capt. Kenneth J. Hayward, F.E.S., 492, High Road, Chiswick, was elected a member.

Mr. Tonge, ova of *Eucosmia certata* laid on barberry in gardens at Reigate.

Mr. A. W. Dennis, flowers of the Bogbean, *Menyanthes trifoliata*.

Mr. H. J. Prior gave a lecture, "The Life of the Bee," with a series of lantern slides in illustration.

*May 24th.*—Messrs. G. A. W. Stolzle and R. W. Stolzle, of Forest Hill, J. F. Johnstone and C. H. Cork, of Rayleigh, Essex, and F. A. Parker, of Cricklewood, were elected members.

Mr. Parker, a strikingly aberrant form of *Brenthis euphrosyne*, taken near Portsmouth, and a female *Euchloë cardamines*, with streaks of male orange coloration.

Mr. Enefer, a sample of biscuits with larvae and imagines of the beetle *Phyllobius argentulus*, and a sample of lentils from Egypt infested with *Bruchus pisi*. [?]

Mr. Mera, a series of *Venilia macularia* which had been two years in pupa.

Mr. Blair, empty galls of the Cecidomyiid, *Mycococcus ovalis* on a bark-encrusting fungus.

Mr. R. Adkin read a paper, "Some Ancient Naturalists and their Work."

**Subscriptions for Vol. XXXV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1923.]**

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*Duplicates*.—*Aglaia*, *Adippe*, \**Io*, *T. quereus*, *Coridon* vars., \**Fulginea* (Reading), \**B. quereus* ♀, *Tilia*, *Menthastri*, \**Linariata*, *Aurantaria*, *Leucophaea* vars. *Paniscus*. *Desiderata*.—Pupæ of *Dictæoides*; Imagines of *typhon*, *palpina*, *camelina* (dark), *Curtula*, *Pyra*, and numerous others; Ova of *Hispidaria*.—*Harold B. Williams*, 112a, Bensham Manor Road, Thornton Heath, Surrey.

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## MEETINGS OF SOCIETIES.

**Entomological Society of London**.—41, *Queen's Gate*, *South Kensington*, *S.W. 7*, 8 p.m. *October 3rd, 17th*.

**The South London Entomological and Natural History Society**, *Hibernia Chambers*, *London Bridge*. *Second and Fourth Thursdays* in the month, at 7 p.m.—*Hon. Sec.*, *Stanley Edwards*, 15, *St. German's Place*, *Blackheath*, *S.E. 3*.

**The London Natural History Society** (the amalgamation of the *City of London Entomological and Natural History Society* and the *North London Natural History Society*) now meets in *Hall 40*, *Winchester House*, *Old Broad Street E.C. 2*, first and third *Tuesdays* in the month, at 6.30 p.m. *Visitors welcomed*. *Hon. Sec.*, *W. E. GLEGG*, 44, *Belfast Road*, *N. 16*.

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**Notes on the Psychides.** (With two Plates.)

By REV. C. R. N. BURROWS, F.E.S.

(Continued from page 118.)

The amplifications in the drawings which accompany this section of my notes are not identical, the insects themselves being of very different sizes. The figures are therefore designed to fill the space, as far as may be, symmetrically. I have not attempted to represent any but the most important features. All the figures are sternal, the objects being viewed from beneath.

A glance at the plate will show at once a considerable difference in the appearance of the objects. Half the diagrams are of the species which possess the \*eighth segmental rods, the other half of those which do not. It is a somewhat curious coincidence that the Palaearctic species catalogued by Tutt, if allowance be made for doubtful forms, divide almost exactly into these two categories, the division coming at number 81, out of a possible 143.

The important points to which I have invited attention will, I hope, be at once evident. First the pulvilli, to my mind the most distinctive feature in the Psychid genitalia. It will be noticed that while always present and attached to the bases of the valves, they have somewhat different forms and positions. In *Solenobia* for instance, they are in contact with the valve, even partly lying over it, a condition which recurs lower down in the list. In *Fumea* they are connected with an elongation of the costa of the valve (Pierce's "transtilla"), and in a large section of the rod-bearing species, they occupy the apex of the central tube (? Pierce's anellus), while in some of the species with short rods (and also those which have plates instead of rods), they are again attached to the costal extension. Secondly the sacculus, varying in form, and sometimes in position, upon its valve. I have represented but few examples of this variation, but I may mention that in contrast with the large sacculus of *Amicta*, we meet with the tiny form, scarcely more than a papilla, in *Psychidea*. Thirdly in importance, the sharp difference between the non-rod-bearing and the rod-bearing species (with those bearing a plate in place of rods).

I have throughout these notes feared that much which I am writing must be lacking in lucidity, to such as have not devoted special attention to the final segments of the Lepidoptera, and for this reason I have tried to confine my descriptions to the simplest terms, in order that my readers may, even if the subject be more or less new to them, be able to follow my meaning.

It is difficult to make a digest of the classifications adopted by former writers upon this subject, but as I have already mentioned there has been a frequent custom of dividing the Psychides into two parts, widely separated, one section appearing in the Macro- and the other in the Micro-Lepidoptera.

Several different points of division have been selected by investigators. Tutt, while himself discarding this separation, points out that

---

\* I have attributed these rods to the 8th segment, as the most reasonable connection, but they appear sometimes to arise from 8-7 intersegmental space, I imagine that as they obviously actuate the following segments, they must in every case be connected to the edge of the 8th.

there is a "change of tune" if I may call it so, between *Bacotia*, and *Proutia*, as placed in his catalogue. Staudinger and Rebel (*Catalog.*, Ed. 1901) place this division between *Bacotia* and *Dissoctena*. Meyrick (*Handbook*), dealing with only British species, places the *Psychina* between *Pterophoridae*, and *Zeuzeridae*, while *Epichnopteryx*, *Fumea*, *Solenobia*, *Talaeporia*, *Narycia*, and *Diplodoma*, are relegated to the *Tineidae*. We recall also the separation, into different volumes, in Stainton's *Manual*. None of these writers has touched, at least effectively, upon the subject of genitalia, which appear to indicate a very sharp division at a new position.

In sorting out my material I have felt compelled to remove *Lypusa manivella* from the group. My reason is simply that the structure of the final segments of the male of this species does not fall into line with the *Psychides*. Staudinger, I am glad to find, takes the same view.

I have retained as far as may be, the classification, and the arrangement, adopted by Tutt, and have been much encouraged and supported by finding how little difference I have had to make, as a result of my own investigations, from the conclusions of previous workers.

The chief changes have been in the necessary transposition of the genera *Bijugis*, and *Psychidea*, and a small divergence from the opinion of Dr. Chapman, as to the position of *Dissoctena*, previously referred to. It may be, however, that as the work of discrimination and sorting out of the species proceeds, it will be necessary to shift the position of some of the genera. I should myself for instance, wish that all the similarly formed pulvilli should come nearer together, and all the long, or short, rods.

I have given with each diagram a figure of the central organ, and of the 7th sternite, when necessary.

I have figured first two outlines of *Fumea casta*, the one with the valves closed, and the other with the same opened, because this is the commonest British species, and because the structure is very simple and easy to understand. Any of my readers should, without much difficulty, be able to procure specimens of this species, and if inclined to do so, prepare mounts for the microscope.

In the drawing with the open valves it is distinctly seen how the opening distends, or inflates the pulvilli, and also the relation of the saccus to its valve. I have in both these figures given a diagram of the anterior tibia and its spur, that it may be evident how we arrive at the "ratio of position" to which I have already devoted a considerable space. The spur points towards the claws, and the measurements required for the calculation are, the distance of the origin of the spur, from the lowest point of the tibia, divided by the whole length of the tibia ( $AB \div AC = X$ ). I refer again to this species in its proper place.

\**Diplodoma herminata*.—It will be observed that the central organ is acicular and hooked, while the pulvilli appear as outgrowths of the valve-bases. There is also an elongation of the valve costa towards the central area, forming a stalk ("Transtilla divided" of Pierce).

---

\* I am not satisfied with my figure of this species. The insect is small and the final segments much "cupped" (*i.e.*, concave), making it well nigh impossible to produce a good mount. My efforts have resulted in a figure which is evidently too broad, but which, I think, fairly represents the structure.

*Solenobia inconspicuella*.—Exactly reproduces the features of the last species. It will be remembered that the female of the first species is fully winged, while that of the latter is entirely apterous.

Both species have the sacculus well separated from the valve, and bearing a single point at the extremity, and also the *dorsal tufts of hairs upon the ninth segment*.

*Fumea casta*.—The pulvilli here are placed upon the stalk noticed above. The sacculi are well separated from the valve, but bear a dentate extremity. There are no tufts of hair upon the ninth segment.

*Dissoctena albidella*.—This species falls into the *Fumea* group. The pulvilli are comparatively large. This genus, placed between *Talaeporidae*, and *Luffidae*, by Tutt, is that against whose position Dr. Chapman protested. It has no close connection with *Bijugis* as suggested by him, for the affinities of that genus are with *Epichnopteryx*. I have however been able to place it much nearer the desired position than in Tutt's list.

This *Fumea* group includes, besides the above genera, *Proutia*, *Bruandia*, *Masonia* and *Psychidea* (the latter with modifications).

All the preceding species are delicate in structure, and have more or less squared segmental plates.

*Whittleia undulella*.—This species represents the *Epichnopteryx* group. The structure here is much more stout, the chitin being hard and dark. The peculiarity lies in the wavy form of the sacculus, which produces the curves of the sides of a violin. Otherwise the details are as in *Fumea*.

This group includes *Bijugis* (of Heylaerts, and Tutt) and *Epichnopteryx*. The smallest *Epichnopteryx* in the Palaearctic fauna, *E. tarnierella*, does not quite agree with the genus, for it has no produced saccus, and exhibits other peculiarities in general structure. I have another specimen from Herr Bang-Haas labelled "Syria," which although undoubtedly distinct, falls in with this little species.

I come now to the species with segmental rods\*.

*Apterona pusilla*.—Here the formation previously noted would at first sight appear to be completely changed, but examination will show that the essential points are perfectly in agreement with the *Psychid* facies. The pulvilli are little developed, and appear to be in a state of transition, midway between the "affixed," and the "tubular," formation. They are still closely attached to the valve bases, and appear to extend† downwards into the saccus. The saccus is also a departure from previous structures, possessing laterally projecting winglike pieces. These wings are peculiar to *Apterona*. The rods are very long and naked.

\* By long rods I mean that they are extended well beyond the ring of coarse spines which surrounds the hind edge of the seventh segment. By short I mean that they do not extend beyond that ring of spines. These coarse spines are characteristic of the rod-bearing *Psychides*.

† It is possible that the tube to which the pulvilli in the following species are attached, may exist in all the *Psychides*, but be exceedingly weak, and not discernable in the smaller and non-rod-bearing portion. If it be so the connection extending downwards into the saccus in this genus may be the first indication of the tube, due to the optical thickening of the sides. These extensions are evident, though not so well developed, in the larger species where pulvilli are affixed to the valve, as in *Acanthopsyche*, *Pachythelia*, *Caneophora*, *Amicta*, and *Eumeta*.

The genus *Apteron* is a puzzling one. Of the four species which I possess I can say but little. I have not been able to discover any difference of importance. Of each of two species I appear to have two forms, the one large and the other small. The larval case in this genus is helical, and the pupa is stated to assume the curve necessary for its comfortable accommodation in the case. Pierce and I have found that the abdomen of the imago presents the same peculiarity, by still preserving the curve.

*Arctus bruandii*.—This species is an example of the group with short rods and sleeves, the pulvilli tubular, and the saccus open, that is, not filled in with dark chitin.

With this genus agree *Psyche*, *Sterrhopteryx*, *Standfussia*, and *Leptopteryx schiffemülleri*.

*Acanthopsyche atra*, L.—This species has short rods and sleeves, but the pulvilli are affixed to the valves, instead of being tubular. The saccus is more filled up, and very strongly connected with the valves (quadrate).

With this genus agree *Pachythelia*, and *Caneophora*.

*Oreopsyche leschenaulti*.—This species has long rods and sleeves, and a very elongate formation of the two final segments. The saccus is peculiar in that its narrow curved arms embrace the quadrate, central, portion. This structure I believe to be specific, and not generic. The pulvilli are tubular. This species is not truly representative of the large long-rod group, which will call for much closer examination, in order to find out points of difference, and further separation. It would appear that this will rest upon the relative length of the rods, or upon the form of the sternites, which present many differences very difficult to follow. Some are single, some double (or twinned) and some of these latter are angulated in outline. The assortment of the specimens is made doubtful, by uncertainty as to their correct identification.

To this group belong *Phalacropteryx*, *Pyropsyche moncaunella*, Chapman, and *Hyalina*.

*Ptilocephala plumifera*, Ochs.—I have received this form, with the peaked extremity, under several names. Varieties, *ralesiella* and *castiliana*, are the same species, and I believe also, *Phalacropteryx mediterranea*, if I really have a specimen of this latter form. But I have also a few other examples sent to me under different names, which can scarcely be *plumifera*. I have doubts therefore whether the peak be a specific feature, and only give it here as a possible indication of a group, while not removing it at present from related species. The formation is as the last species, but the rods are not quite so long.

*Amicta lutea*.—This species represents the insects which possess a large plate in the place of rods. The valves here are much more free and open readily, approaching thus the *Fumea* form. The pulvilli are affixed to the valve and partly fold over the surface. The sacculus is as large as, if not larger than, the valve. The saccus is open, long, and more or less quadrate. The sleeves to the plate extremities are short. With this genus probably agrees *Eumeta* (*Clania*).

To this last group appear to belong the greater number of the larger Exotic *Psychides* which have passed through my hands. North and South America, Africa, Asia and Australia, all supply such species. So far as I can discover very little is yet known about the smaller

RÉSUMÉ OF THE RESULTS OF THE EXAMINATION OF 85 GENERA, AND ABOUT 100 SPECIES OF PSYCHIDES.

- A. Without 8th segmental rods. Ventral view of 9th and 10th segment generally rounded, length approaching breadth.  
 Pulvilli affixed to valves. Saccus widely separated. With spur MELASSINA, PENESTIGLOSSA, DIPLODOMA, NARYCIA. Females winged.  
 Pulvilli affixed to valves. Saccus widely separated. With spur SOLENOBIA, TALAEFORIA, LUFFIA, BANKESIA. Females apterous or nearly so.  
     FUMEA form. Saccus V-shaped. Spur to most.
- Pulvilli stalked to valves. Saccus not widely separated. Spur (except in DISSOCTENA and ? *vestatis*).  
 Pulvilli stalked to valves. Saccus large, dentate. BACOTIA, PROUTIA, BRUANDIA, MASONIA, FUMEA, DISSOCTENA.  
 Pulvilli stalked to valves. Saccus small, hooked. 7th emarginate. PSYCHIDEA.  
 [Pulvilli stalked to valves. Saccus not hooked. 7th emarginate. No spur. ? *vestatis*.]
- Pulvilli stalked to valves. Saccus large dentate. 7th emarginate. BRUGIS, WHITTLEIA, EPICHOPTERYX.  
     EPICHOPTERYX form. Saccus wavy. No spur except BRUGIS.
- B. With 8th segmental rods. Ventral view of 9th and 10th segments generally elongate, longer than width.  
 Pulvilli affixed to valves. Rods long, naked. 7th twinned. Saccus winged. No spur. APTERONA.  
 Pulvilli tubular. Rods long, naked. 7th single. Saccus not winged. No spur. SCIOPTERA.  
 Pulvilli tubular. Rods long, sleeved. 7th twinned. Saccus quadrate. No spur. PTILOCEPHALA, PYRORSYCHE, HYALINA.  
     OREOPSYCHE.
- Pulvilli tubular. Rods short, sleeved. 7th single (twined in *Arctus*). No spur. ARCTUS, PSYCHE, STERROPTERYX.  
     STANDFUSSIA, LEPTOPTERYX.
- Pulvilli affixed to valves. Rods short, sleeved. 7th single. Saccus quadrate. Long spur. ACANTHOPSYCHE, PACHYTHELIA, CANEOPHORA.  
 Pulvilli affixed to valves. Plate, sleeved. 7th single. Saccus long, quadrate. Long spur. AMICTA, EUMETA (CLANIA).

“Spur” here refers only to that upon the anterior tibia.

“7th” here refers only to the 7th sternite.

*Psychides* outside the Palearctic Region. I have seen but one *Solenobia* from North America. Another species from the same Continent is represented in the British Museum Collection. It would appear that only the larger, and more conspicuous, species attract attention. Our non-segmental-rod sections should be fairly represented, at least in the cooler parts of the Neo-arctic, if not also in the Southern Hemisphere.

I have not made much of the sleeves into which the rods in most species pass. In some specimens, even of those with long rods, the sleeves are distinctly traceable, to the extremity of the rods. In others the sleeves are scarcely discernable, and are absent in one specimen of a species, and not in another. Again in some species (*Apterona*, and *Scioptera*), these sleeves are certainly absent. I have felt therefore that as a long rod would have a long sleeve, and a short rod a short one, there is not much to be learnt from them. In the short-rod species the sleeves are much more evident than in the long, and are certainly more than mere folds in the outer skin of the abdomen, as one might possibly at first sight conclude.

I am hoping that this bare outline may serve as a basis for further study. My aim has been to contrive such a table as may help to place any unknown specimen in its correct position. I have, as I have stated before, been much hampered by uncertainty as to the correctness of some of the names supplied to me with the specimens, and also by the lack of sufficient specimens to base conclusions upon. I have therefore often been ruled by majorities. Of 50 of the species in Tutt's list, I have no specimen, of 20 I have but one, of 12 only two, of 10 only three. I should have been better satisfied had I been able to secure more duplicates to strengthen my observations. I have also certain specimens about whose identity I am still puzzled, belonging principally to forms of which I possess only one example.

(To be continued.)

**On some Italian races of *Erebia aethiops*, Esp., and of *E. pirene*, Hub. (= *stygne*, O.), and on *E. flavofasciata*, Ruhl-Heyne.**

By ROGER VERITY, M.D.

The name of *medea* of the *Wiener Verzeichniss* may have, by a few months, the right of priority claimed for it by Kirby, but as this is not sure, and Esper's figure and description of *aethiops* are far more satisfactory, I think his name, which is the one in use, can be preserved; Hübner's figure of *medea* is not previous to Esper's, as thought by Kirby. It may seem surprising that a species so widespread in Europe and in Asia should stop short on the boundary of Peninsular Italy, and should not reach the Pyrenees either. I think the explanation rests in the fact that it requires swampy spots under the shade of woods, and that these conditions are too scarce for it in the south of Europe, where the mountains have been laid bare of forests. The races of northern Italy are, in most cases, characterised by a more or less marked reduction in the extent of the red bands. In the giant *taurinorum*, Vrtý., from Turin and the hills of Piedmont (*Bull. Soc. Ent. France*, 1911, p. 312, pl. I, f. 2) the band of forewing has an hour-glass shape. In the Cratlian Alps that band has the same extent and shape, but the size of the insect is far less, the eye-spots are much larger and more numerous,

with large white pupils, so that it is quite distinct from *sapandia*, Frühst., and *rubria*, Frühst.; I propose naming it *CRATTIAE*, mihi, from specimens from Torre Pellice in my collection.

From the Ligurian Apennines (Valle Brevenna in the Alta Valle di Scrivia), Dr. Rocci, of Genoa, describes (*Mem. Soc. Ent. Ital.*, II., March, 1923) a giant race he has collected in the chestnut woods at 600m. to 700m. He claims it to be larger on an average than *taurinatorum* (52mm. in expanse); he describes it as belonging to the same group of races as the latter, with strongly convex outer margins, but having a very extensive and bright fulvous band on forewing and none on hindwing; eye-spots smaller than in *taurinatorum*; light band on underside of hindwings very conspicuous.

On June 11th, 1920, Querci discovered the most southern locality of this species as yet known, just within the boundary of Central Italy, at the Acqua Bianca, 1,300m., on Mt. Pisanino in the Apuane Alps (N.-W. of Tuscany). He was only able to collect two males, but they are so like each other, and so different from the other races I have just mentioned, that I do not hesitate to ascribe them to a new race, calling it *APUANA*, mihi. It stands to *crattiae* as race *etrusca*, Vrtý., of these same Apuane mountains stands to nymotypical *E. neoridas* of the Maritime Alps, by the very small size of the eye-spots, with most minute white pupils, and by the very limited extent of the red bands; in one of my specimens there is a broad gap between the apical part and that round the hinder ocellus, but the red is not reduced to an extremely narrow circle round each ocellus, as in race *parvisi*, Vrtý., from Udine; it probably comes nearer the less extreme *derufata*, Frühst., from Primiero in S. Tyrol; in size, underside and other features *apuana* is quite like *crattiae*.

Turning our attention to another species, a race of which from Central Italy deserves to be recorded, I must first of all remark that I quite agree with Frühstorfer, *Iris*, February, 1918, p. 98, that the species usually known as *stygne*, O., should be designated by the older name introduced by Hübner and by Esper, as *pirene* and as *pyrene*, respectively. Only, I think that of Hübner is not a *nomen nudum*, as Frühstorfer considers it. The names on Hübner's plates are accepted as valid in innumerable other cases, and there is no reason to discuss its validity in this special one. Staudinger, in his *Catalogue* of 1901, refers the race of the Apennines to *pyrenaica*, Rühl, and Turati finds that a specimen in the University of Naples collection quite agrees with his from the Pyrenees. They evidently had before them examples from the Abruzzi, because a single male I possess from Castel del Monte confirms their statement. On the contrary, out of the large numbers collected by Querci in the Sibillini Mts., not one individual is similar to the latter. They are all much darker. In my *List of the Lepidoptera of the Province of Macerata* I called them *valesiaca*, Elws., on this account, but I now see that this was not correct and that it is a perfectly distinct race, to be described as follows:—Small size; wings more elongated and outer margins rather straighter than in most other races; colour of a very deep black in the male and always dark also in the female, never having the faded tone of some Alpine individuals on both surfaces (Calberla notes that the underside of hindwings also of the Abruzzi females, is very dark); ocelli constantly very small, and with a very minute white pupil; there are never more than three in

the male on the forewing, and sometimes only the two apical ones; the red band in the male is always very reduced in extent, but not as much as in *valesiaca*; usually not entirely broken between the apical ocelli and the hinder one, although it is often reduced to a faint and narrow streak; broader and of more even breadth on underside; on hindwings above three red circles round the eye-spots always present, but never confluent, and in some cases very thin; light band of underside scarcely ever perceptible in the male. In the female the bands and eye-spots do not differ as strikingly from those of the nymotypical race; they are considerably less extensive than in race *etruriae*, Vrtý., *Ent. Rec.*, 1919, p. 124 (= *costantinii*, Turati), from the Apennines in Northern Tuscany, but much less so than in the first female, wrongly figured by Seitz on pl. 35 of *Gross-schmett.*, under the name of *stygne*, whereas it is a very extreme *valesiaca*. For the race of the Sibillini Mts. I suggest the name of **TETRICA**, mihi.

As I am dealing with this genus, I must take the occasion to say a few words in answer to Mr. B. C. S. Warren's question concerning *E. flavofasciata*, Heyne-Rühl., in his interesting paper in *Ent. Rec.* of May last, p. 78. The question he puts is whether the race he has collected near the Tschierva glacier, in the Engadine, is the nymotypical one of the Campolungo Pass, in Tessin, or *thiemei*, Bartel, of Pontresina. Possessing a nice series of the former and "co-types" of the latter, sent to me by Bartel himself, I have ascertained at a glance that Warren's specimens come distinctly nearer *thiemei*. To be more accurate, however, I should notice that only two of the twelve he figures on pl. I. are really exactly similar to Bartel's, *i.e.*, the male and the female, with the broadest and most continuous underside band, at the bottom of column I. The ten others have the band much more reduced and broken than in *thiemei*, and constitute a much more extreme and distinct race than the latter, standing opposite the nymotypical *flavofasciata*, and well worth distinguishing by the name of **WARRENI**, mihi.

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### The Growing Importance of Entomology.

By H. S. FREMLIN, M.R.C.S., L.R.C.P., F.E.S.

To most collectors Entomology means collecting butterflies and moths, getting as many species of these as possible, having good series and as many varieties as one is able to obtain. To such an one the "Bath White" and the "Camberwell Beauty" are always looked-for prizes, and the mind turns now and then with longing to a "Clifton Nonpareil," or a "Crimson Speckled Footman;" to all the "Large Copper" is a gem in the collection, even though it must be obtained at Stevens'. There are other Collectors who hunt for beetles, or dragonflies, or bees, and here and there one who works for grasshoppers or earwigs; but these are few.

To all such collectors a new species, a rare specimen, an extraordinary variety, or some special form such as a beetle that looks like a wasp, or a butterfly that birds like the taste of, disguising itself as another sort that birds do not fancy; all of these are of great interest, and about them societies are formed, meetings are held, evenings are spent, and month by month, year by year, they are exhibited and

discussed, whilst *the* important things of Entomology, its relations with plant-life and medicine are lightly passed over.

As the idea of getting a collection fades there arises, however, in the mind, a hazy idea of the real, vast and increasing importance of Entomology in the world. In this paper I wish to bring to your notice two of the features that are most prominent; the first is: Insects and their influence in the Vegetable Kingdom; the second: the part Insects take in the Causation of Disease.

The fact that all people and many animals are dependent on vegetable life for their existence, is of course well known; yet until a few years ago very little was systematically carried out to keep insects in check, and not much was known of their life-history; when they came and the leaves and flowers disappeared from tree or plant leaving only stalks, they might be syringed with a mixture of soft soap and water, or soot, or lime be dusted over them; if these remedies failed, hand picking, when possible, was tried, but this was generally done when most of the larvae were full fed and the crop already destroyed.

Thousands of acres of crops were blighted by Aphides every few years, and part of a county frequently suffered from vast numbers of the "Winter Moth" larvae, which ate the expanding buds and young leaves of oaks, apples, nuts, pears, etc., leaving the trees without either leaves or flowers, and looking as they would in the middle of winter, and so much injured that not only was the crop destroyed for that year, but after the trees had apparently recovered they were too weak to produce a satisfactory crop in the following year. No remedy for either the Aphides or "Winter Moth" was then known. Abroad locusts frequently swept over miles of vegetation leaving the country bare. Probably even now 2% of the crops are destroyed each year by insect attacks on seeds, seedlings, roots, wood, stems, leaves, flowers and fruit, also on stored grain, flour and other food. What does this loss represent in money? Given that there are 1,500,000,000 people in the world and that each individual requires one shilling's worth of vegetable food a week which amounts to £3,750,000,000 a year; 2% of this is £75,000,000. The insects that cause this enormous loss belong to all the Orders, larvae of moths attacking forests destroy the leaves over thousands of square miles, or attacking fruit trees live in the open buds, destroying leaves and flowers, piercing holes in the young fruit. Larvae of both moths and beetles do great damage to forest trees, not only do they feed on the wood, and either destroy the trees or so interfere with their growth that they are worthless as timber, but also drill holes into felled trees and so spoil them; much wood is rendered useless by "Worm" in this way.

Locusts, another scourge, living when young in wild grassy areas, on reaching maturity and having acquired wings, fly in vast clouds from place to place, clearing all vegetation wherever they settle. Another insect, the ant, is also very injurious to general vegetation. The White Ant of the Tropics is one of the most destructive insects known, travelling in vast numbers it destroys wood, clothes, leather, in fact anything but metal or stone, that happens to be on its line of march. A curious insect known as the "Scale" attaches itself to the bark of branches, to twigs and leaves, especially to oranges and lemons, and sucks the sap: it is often present in such numbers as to cover whole limbs, greatly interfering with growth and crop. Cockroaches are well

known in houses and cause much damage and discomfort. Aphides or plant lice can blight the leaves of nearly every sort of tree or plant, and, when the seasons are favourable to them, increase in such vast numbers as to destroy the crops and almost kill their hosts. These are but few instances of the great power of destruction possessed by insects. However, for some years now a great deal of work has been done to lessen the damage thus caused. The late Miss Ormerod was one of the first to draw public attention to the great harm done to crops by insects, and her book on *Injurious Insects* and the suggestions there made for their control were sorely needed and have proved extremely useful.

At the present time there are workers on Economic Entomology in many parts of the world, and they are doing a great work, not only in studying the life-history of injurious insects and finding new species, but also in preparing and testing remedies, and most important of all, growing the parasites that attack injurious insects, and where possible obtaining these in sufficient numbers to send to other countries where the same crops grow but where the parasites do not exist naturally. The most effective remedies for insect pests, are other insects and fungi which act as parasites.

Turning now to the association between Entomology and Disease, practically nothing was known before 1898. The Tse-Tse fly was known to destroy horses and cattle in Africa, and cattle and sheep were worried and at times died of attacks by larvae of carnivorous flies. When Ross discovered the parasite of Malaria in a mosquito and showed how this parasite was carried to man, the Medical world realised that a new light was shed on the cause of disease, and that our knowledge of infection had now brought another science in touch with Medicine, and Entomology was permanently linked to it and to be considered in all questions of the cause and prevention of disease.

Since then many insects have been shown to set up disease either (1) by simply carrying an infective agent on their feet, as the house fly carries the germs of Typhoid fever, Dysentery, Cholera, etc., or (2) as a biting insect that carries the agent of disease on its proboscis and thrusts this into the blood stream of the host, as the flea carries the plague bacillus from an infected rat; or (3) by the insect itself becoming the host for the partial development of a parasite which escapes from it in the saliva and is so transmitted to man; in this way a mosquito carries the Malaria parasite.

Knowledge of insect infections has so extended that Entomology is now one of the most important branches of Tropical Medicine. When M. de Lesseps attempted to dig the Panama Canal, he failed on account of the enormous death roll of all who ventured to undertake the work. The cause of the disease was then unknown; but when the connection between Entomology and Medicine was better understood it was found that a mosquito was the cause. This mosquito was banished by clearing out its breeding grounds on both sides of the track, and the death roll became practically nil. West Africa, up to only a few years since, was known as "The White Man's Grave"; now it is simply a hot country where with care one can remain healthy. Again, all have read of the Plague, a disease that has killed tens of thousands and almost destroyed nations, it is now known to be carried by a flea. The above are only a few illustrations of the known connection between insects and disease.

So that, as you see, insects carry destruction into the vegetable world, and disease and death into the animal kingdom; this great multitude of butterflies, moths, wasps, flies, grasshoppers, beetles, aphides, mosquitos, midges, fleas, thrips, lice, and so on, coming into existence every day and rising as a cloud over the earth, these are to be controlled, the friends improved and multiplied, and the enemies hunted out and destroyed. Specialists are doing their best, and a large amount of good work is being done. National thanks are due to the Entomological Societies who, entirely unsupported from without, are at present the chief trainers of Collectors, not only bringing them among colleagues, but giving them at any time the best advice.

With all this however there is a lack of central organisation; nothing corresponding to The College of Physicians exists; no examinations are held in which Entomology is a subject, so far as I know, and no degree given by Universities. It has to be taken up as a hobby, or learned by those who are necessarily brought in contact with insect pests, as gardeners, or as agriculturalists. For a subject of such universal importance to all living things, when every man should know what harm a fly or a mosquito may do, and anyone who grows vegetables or keeps fowls should know how to kill caterpillars and lice, surely a central organisation is necessary; a College of Entomology, where men are trained in all branches of this subject, where insects and their parasites are investigated, where insect blights of individual species of plants growing in various parts of the world could have the pests and their parasites studied, where arrangements could be made to distribute useful parasites. This central body should be linked up with Stations in all parts of the world to give advice, examine specimens and receive reports. Investigations carried out in the Tropics on pests or disease-producing insects should be notified, and when necessary experts could be sent out to assist the investigator. Inspectors should also form part of the Central Staff to assist in training the public by lectures, advice and practical help. A definite system of training should be required of all who were Members of this College. They should have a general knowledge of all orders of insects and make a speciality of one. They should also have a good knowledge of Botany, which is essential in connection with vegetable blights, and of Chemistry, so necessary in dealing with Insecticides both in their preparation, use, and, where necessary, analysis.

This is only a slight outline of the great and growing importance of Entomology, and I trust that this paper may lead others better qualified to bring the subject before the notice of the public, that they may develop some definite scheme worthy of such a universally important Science.

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### Psychides.

The Rev. C. R. N. Burrows, F.E.S., The Vicarage, Mucking, Stanford-le-hope, Essex, is very desirous of obtaining specimens of the following species of *Psychides* of which he has hitherto been unable to obtain even a single example.

*N. astrella*, *D. adspersella*, *P. melas*, *P. punctata*, *P. melana*, *S. suifunella*, *S. fumosella*, *S. pallida*, *B. douglasii*, *B. conspurcatella*, *B. montanella*, *B. defoliella*, *T. borealis*, *T. improvisella*, *S. technica*, *S.*

*pretiosa*, *P. rouasti*, *B. raiblensis*, *B. norvegica*, *M. saxicolella*, *B. alpherakii*, *P. nigrolucidella*, *P. staudingeri*, *P. millierei*, *P. flavescens*, *P. kuldschaensis*, *E. mentonella*, *E. alpina*, *E. hofmanni*, *E. flavociliella*, *S. helicinoides*, *A. calberlae*, *P. detrita*, *P. stigmatella*, *P. minutella*, *P. fulminella*, *H. wockii*, *O. vesubiella*, *O. inquinata*, *O. staudingeri*, *A. maritimella*, *A. oberthueri*, *A. jordani*, *A. uralensis*, *A. grummi*, *A. sera*, *Euneta pungeleri*, *E. minuscula*, *E. pryeri*, *E. aurea*, and also additional specimens of the following species of which he has only one or two, generally imperfect examples: *P. dardoinella*, *S. nickertii*, *B. vernilla*, *M. subflavella*, *Bijugis graeae*, *B. altaica*, *A. helicinella*, *A. bruandi*, *A. constancellae*, *P. crassicornis*, *P. gondebantella*, *H. malvinella*, *H. lucasi*, *O. tabanivicinella*, *O. colossa*, *A. senex*, ? *A. tedaldii*, *A. quadrangularis*, *A. oschi*, *C. japonica*, *D. ragonoti*, *M. ciliaris*, *M. lugubris*, *S. clathrella*, *D. granigerella*, *B. comitella*, *P. nocturnella*, *A. praecellens*, *A. viadrina*, *S. standfussi*, *L. schiffermilleri*, *O. silphella*, and any species at present unnamed.

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### Seven New Varieties of *Abraxas grossulariata*.

By Rev. G. H. RAYNOR, M.A.

The following very definite forms of this wonderful species seem to me worthy of varietal names, which I hereunder append to the technical descriptions of each distinct aberration.

#### GROSSULARIATA.

ab. *aberdoniensis*, mihi.—Forewings much clouded with black, but having constantly a large irregular oblong patch of white adjoining the black basal blotch on the inner margins of the forewings. The late Arthur Horne reared this freely at Aberdeen, and I have bred several from Yorkshire.

ab. *antemarginata*, mihi.—Forewings with a black band in the actual specimen I am describing 3mm. broad in its upper half, but only 2mm. broad in its lower half, extending from the apex to the tornus, of the forewings. This band replaces the usual black marginal spots. Reared by the Rev. C. R. N. Burrows from Mucking, Essex, in 1923.

ab. *postmarginata*, mihi.—The hindwings with a broad black band similar to the one I have just described as occurring on the forewings (in ab. *antemarginata*). A specimen appeared in the Sydney Webb sale a short time ago, but I have no note of its origin.

ab. *nigroapicata*, mihi.—At the apex of each forewing is a black blotch—5mm. long  $\times$  3mm. broad in the specimen here described—extending from the apex to the black median band. It thus contrasts strongly with ab. *fulvopicata* in which the apical blotch is fulvous. A male bred from a wild York larva by myself in July, 1920.

ab. *nigrolineata*, mihi.—On the forewings is a broad horizontal black line, varying in width from 1 to 2 mm., uniting the disc to the basal blotch. Occurs in *grossulariata* and *varleyata*, but not so far in *lacticolor*.

## LACTICOLOR.

ab. *subangulata*, mihi.—Beneath the disc of the forewing is a black angular (or elbowed) line varying in intensity, but very distinct. Although this peculiarity is not very rare in *lacticolor*, I have reared only one *grossulariata* possessing it.

## VARLEYATA.

ab. *nigrocretacea*, mihi.—Very similar to ab. *exquisita*, but having the white areas larger and more transparent. On the hindwings the only black markings, besides the discs, are a faint black transverse band, so broad as to cover about a third of the wing, and a row of small black spots, sometimes forming a narrow band, round the edge of the outer margin. This very charming variety has been evolved from ab. *varleyata*, and possibly does not occur in a wild state. I have bred a few examples suffused with yellow—a very handsome insect. (Locality Yorkshire).

## CURRENT NOTES AND SHORT NOTICES.

Entomology is slowly becoming recognised in high places. We read with pleasure in the daily press that a Civil Pension has been granted to Miss Bacot, who was wholly dependent upon her brother the late A. Bacot, in recognition of his devotion to the scientific investigation of disease.

*The London Naturalist* for the year 1922 consists of about 40 pp. of matter other than entomological. A report of half a page of very short summaries of five field meetings represents, "almost exclusively," the work of the Entomological Section during the year. Ornithology and Archaeology seem the chief lines of study of the present members of the Society, which years ago made its name as the City of London Entomological Society, in the days of Clark, Bacot, Prout, etc. There are two plates of birds.

The *Vasculum*, a North Country Quarterly, was established nine years ago to deal with Science and Local History, more particularly of the six northern counties of England. Among the names of those responsible for its contents we note the Rev. J. E. Hull, M.A., editor, our colleague R. S. Bagnall, F.E.S., E. Ernest Green (President of the Entomological Society), J. W. H. Harrison, D.Sc., etc., and F. C. Garrett, D.Sc. (Business Editor). In a circular sent to us we read that in spite of "a great increase in the circulation we have not yet become self-supporting," and the editors appeal for further subscribers of 5s. per ann. Those numbers of the magazine which we have perused were most interesting, and appeal strongly to all field workers.

The final part of the *Annales de la Société entomologique de France* for 1922 contains, I., J. A. Lestage, Catalogue des Éphémères de France; II., E. Rabaud, sur la Nidification de *Ceratina callosa* (Hym); III., L. Sheljuzko, Lépidoptères nouveaux ou peu connus de la Sibérie (plt.); IV., E. Fleutiaux, Les *Melasidae* du Japon (plt.);

V., F. Brocher, Biologie et physiologie des *Dytiscides*; VI., Dr. Gautier, Un Aleurode parasite du Poirier (plt.); VII., P. Lesne et L. Mercier, Un Staphylinide parasite des Muscides fucicoles (plt.); VIII., E. Séguéy, Nouveaux Anthomyiaires (Dip.); IX., A. Mequignon, Les *Melasiidae*; X., C. Oberthür, Notice nécrologique sur Rowland-Brown.

The *Transactions of the Carlisle Nat. Hist. Socy.*, Vol. III., has now been issued. Vol. I. was issued in 1909, and Vol. II. in 1912. The inordinate delay of Vol. III. has been caused by the incidence of the war, the untimely death of Mr. Dunlop, one of the chief contributors, and to the heavy cost of printing. The List of Coleoptera by Mr. F. H. Day is now completed, that of Lepidoptera by Mr. G. B. Routledge is completed to the end of the Geometers and in later volumes the groups of smaller moths will be dealt with. We congratulate the Society on its achievements and on the continuance of its youthful enthusiasm.

Parts I. or II. of the *Transactions of the Entomological Society of London* have just been issued and contains fourteen separate papers and forty-eight pages of Proceedings. I., H. E. Andrews on the Schmidt Goebel Types of *Carabidae*; II., H. J. Carter, a Revision of the Australian Species of *Melobasis* (Col.); III., Malcolm Burr, B. P. Campbell, and B. P. Uvarov on the Orthoptera of Macedonia; IV., G. T. Bethune-Baker, on the Pupal Shell of *Lachnocnema bibulus* (Lep.); V., A. J. Turner, a Lepidopterous Scavenger living in Parrot's Nests; VI., F. Muir, on the Genitalia of some Diptera and of *Merope tuber*; VII., R. J. Tillyard, on the Mouth-parts of the Micropterygoidea (Lep.); VIII., C. B. Williams, Records and Problems of Insect Migration; IX., T. G. Sloane, Classification of the *Carabidae*; X., G. B. Walsh, Growth of the Larva of *Dicranura vinula*; XI., F. Silvestri, Thysanura, Termitidae, and Embiidae of Mesopotamia; XII., H. Eltringham, the Larva of *Pterocroce storeyi* (Nemop.); XIII., C. L. Withycombe, Notes on the Crocini (Nemop.); XIV., J. Waterston, the Mallophaga of the Shackleton Expedition. There are thirteen plates and numerous woodcuts with 290 pages.

At last the *Proceedings* of the South London Entomological and N. H. Soc. have been issued for 1922. It is the most pretentious volume the Society has so far issued, consisting of 180 pages and 8 plates. A full review will be published later on.

An interesting *Bulletin* (no. 295) has been issued by the Ontario Department of Agriculture, on the European Corn-Borer in Ontario. This Lepidopteron, *Pyrausta nubilalis*, is another emigrant from the old continent which has flourished amazingly in the new. It had already been recognised as a pest in some parts of Austria, and was probably introduced about 1909. Although originally attached to hops, hemp, broom corn, and millet, its favourite pabulum now is Indian maize. It was discovered as a pest about 1920, in Elgin Co., Ontario, and has gradually spread since over some two dozen counties of the Dominion.

We have received from Mr. G. T. Bethune-Baker one of those extremely useful monographs which he periodically issues on a genus of the *Lycaenidae*. The present one deals with the difficult genus *Catochrysops*, Boisdu. (sens. lat.), in the light of modern morphological research. It contains 21 plates, of which three are coloured, illustrating imagines, appendages, and androconia.

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## SOCIETIES.

## THE ENTOMOLOGICAL SOCIETY OF LONDON.

April 4th, 1923.—ELECTIONS.—The following were elected Fellows of the Society:—Mr. G. F. Gee, Houldsworth, near Cherisey; Mr. J. B. Hicks, 99, Barkston Gardens, S. Kensington, S.W. 6.

EXHIBITIONS.—Mr. Thos. Greer, a visitor, expressed his thanks for the opportunity given him of attending the meeting, and exhibited a number of Lepidoptera from East Tyrone.

Mr. H. D. Riley exhibited and described a new Satyrid butterfly from East Africa.

Mr. F. D. Morice exhibited and made remarks upon a rare British Hymenopteron, *Pseudogonalos hahni*, Spinola.

Mr. H. J. Turner exhibited examples of *Colias behri*, Edw., from the Yosemite Park, U.S.A., at 9,700 ft.

May 2nd.—ELECTIONS.—The following were elected Fellows of the Society:—Dr. R. C. Lowther, M.B., Ch.B., Fernleigh, Grange-over-Sands, Lancs; Mr. John D. Sherman, Junr., 132, Primrose Avenue, Mount Vernon, New York, U.S.A.

WICKEN FEN FUND.—The Treasurer made a statement on the financial position of the Wicken Fen Fund and made an appeal to Fellows for further contributions.

EXHIBITIONS.—Mr. W. G. Sheldon exhibited types of *Argynnis aglaia* race *scotica*, Watkins. (*Ent.*, Vol. LVI., pp. 109.)

Professor E. B. Poulton, F.R.S., read notes on:—(1) The meal made by a monkey on Lepidopterous larvae and pupae; (2) Some striking examples of mimicry in Butterflies from the Federated Malay States.

Mr. W. J. Kaye exhibited some Nymphaline butterflies that showed the upper surface pattern as seen from beneath in a floating flight. Professor Poulton in discussing Mr. Kaye's exhibit read a letter from Lord Rayleigh, F.R.S., on the optical interpretation of this phenomenon.

Mr. C. L. Withycombe exhibited and gave some account of an Ascalaphid larva from Nyassaland.

Mr. T. W. Kirkpatrick exhibited living larvae of *Pterocroce storeyi*, Withycombe, from near Cairo, and distributed several to Fellows desirous of breeding the perfect insect.

Mr. O. E. Hanson exhibited examples of *Leistus montanus*, Steph., from the Knockmealdown Mts., Co. Waterford.

PAPERS.—The following papers were read:—(1) "On the classification of the *Carabidae*," by Mr. T. G. Sloane. (2) "Observations on the growth of the larva of the Puss Moth (*Cerura vinula*, Fab.), by Mr. G. B. Walsh, B.Sc. (Communicated by Mr. E.C. Bedwell.) (3) "On Thysanura, *Termitidae* and *Embiidae*, collected in Mesopotamia and N.W. Persia, by Mr. W. Edgar Evans, B.Sc., and Dr. P. A. Buxton," by F. Silvestri. (Communicated by Mr. K. J. Morton.) (4) "On the larva of *Pterocroce storeyi*, Withycombe (*Nemopteridae*)," by Dr. H. Eltringham. (5) "Systematic notes on the Crocini (*Nemopteridae*) with descriptions of new genera and species," by Mr. C. L. Withycombe, M.Sc. (6) "On the Mallophaga of the Shackleton-Rowatt Expedition, 1921-1922," by Dr. J. Waterston.

## REVIEWS AND NOTICES OF BOOKS.

Part 27 of the *Lepidopterorum Catalogus* has recently been issued. It deals with the *Parnassiidae* and consists of about 250 pages. The compiler is F. Bryk who is well known for his study of this group for many years. The voluminous references and the general arrangement backed by a detailed closer search, prove that the contribution is quite worthy to be classed with the parts of the Catalogue compiled by L. B. Prout, to whose exhaustive thoroughness we have referred previously. *Zerynthia* takes the place of *Thais* as the genus name for *rumina* and its two congeners. *Thais* is a Fabrician genus name (*Ill. Mag.*, Vol. VI., 1807), but was already in use in Mollusca (*Bolt.*) 1798, and therefore by the Rules of Nomenclature not available. Ochseneimer in *Schm. Eur.*, IV., 1816. substituted *Zerynthia*, and this was used by Her.-Schäf., 1835, Treitschke 1840, Mann 1844, etc. Scudder in his *Revision* pointed this out in detail in 1875. This has been accepted by Kirby, 1902, Stichel, 1907, Rothschild, 1918, and others. It is unfortunate that our British insular conservatism has so long prevented us from adjusting oft-pointed-out errors, such as this and *janira* for *jurtina* and *edusa* for *croceus*, etc. Year in and year out we have gone on using *polyxena* of Schiffermüller, 1776 (5). Butler long ago corrected this to *hypermnestra*, Scopoli's name of 1763 (*Ent. Carn.* p. 149.), in his *Cat. of Diur. Lep. of Fab.*, 1869.

Herr Bryk has separated some half-a-dozen species of the old genus *Parnassius* into two small genera, *Kailasius* and *Taduma*, which action had been previously suggested by F. Moore leaving the bulk in *Parnassius* proper.

As an example of the compiler's thoroughness we have selected the well-known species *apollo*. The references to this species occupy over seventy quarto pages, and are dealt with in an analytic way. First are given the references dealing with the species in general; next come references as to the Biology of the species, then as to the Ovum, the Larva, the Tentaculæ, the Pupa, the Palpi, the Antennæ, the Squamæ, the Neuration, the Copulation, the Stridulation, the Parasitation, the Breeding, the Thermo-biology, the Hermaphroditism, the Hybridisation, the Significance of the Wing-ornamentation, and even to the various regulations which have been made as to the preservation of local races like *vinningensis*.

Next the references to the aberrations are given, in alphabetical order with their synonyms. These are succeeded by a series referring to aberrations of neuration dealt with under the three headings, Metathesis, Plethoneurose and Atrophie, with a section devoted to monstrous forms.

The next set of references are to the typical form in particular, succeeded by those to the large number of local races, and to their various synonyms and forms. A conclusion is made with a few names which the compiler considers to be *nomina nuda*. This is probably the most complete and helpful list of references which has ever been made for any one species.

We can only say how much future generations of students of entomology will gain in starting work with such preparation as is afforded by lists of this thoroughness. We congratulate the author and publishers as well as the lucky students of the future.—H.J.T.

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*Desiderata*.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether, "Thelma," 4, Willow Bridge Road, London, N. 1.*

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## MEETINGS OF SOCIETIES.

**Entomological Society of London**.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. October 3rd, 17th.

**The South London Entomological and Natural History Society**, *Hibernia Chambers, London Bridge*. Second and Fourth Thursdays in the month, at 7 p.m.—*Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E. 3.*

**The London Natural History Society** (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. *Hon. Sec., W. E. GLEGG, 44, Belfast Road, N. 16.*

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## The Lido in May.

By GEORGE WHEELER, M.A., F.E.S.

The fortnight from May 18th to June 1st this year I spent at Venice. In Venice itself there are practically no butterflies, but I had three days hunting on the Lido, the fauna of which seems so little known that I thought it well to take specimens of every species I saw. The only part of the Malamocco Lido (the only district visited) which lends itself to the chase is reached by taking the tram from the landing place to the Excelsior Restaurant, and then continuing in the same direction, *i.e.*, southward, on the landward side of the embankment. The top of the embankment, and here and there the seaward slope, may also be advantageously explored. Very shortly after leaving the buildings one enters on a little country lane, and at the entrance to to this, butterflies begin to appear. A few specimens of *Aporia crataegi*, *Pieris brassicae* and *P. rapae* were met with here on each occasion, also *Epinephela jurtina*, *Coenonympha pamphilus*, and *Augiades sylvanus*, the last three being also tolerably abundant throughout the whole extent of the tract visited. Here also on May 30th I took the only specimen of *Polygonia e-album* that I saw. *P. rapae* was much commoner on the vetch with which the top and the landward side of the embankment were clothed farther on. *Colias croceus* occurred very sparingly on May 26th, but was very abundant on the 30th and 31st, the *helice* form of the ♀ being also taken in varying shades of creamy yellow. *Polygonmatus icarus* was not uncommon on the embankment, the only other Lycaenid seen being a single specimen of *Syntarucus telicanus* taken on a small patch of privet by the side of the track. On the 26th, I took one specimen of *Pontia daplidice*, which occurred fairly frequently on the 31st, but only ♂s were met with. *Pyraucis cardui* was present in many hundreds on all three occasions, in every possible condition except that of absolute freshness, a few however being but little the worse for wear. They must, I think, have dispersed later, as I saw no plant on which the larvae could conceivably feed, except a few very stunted specimens of a sea-thistle, which would certainly not have sufficed as pabulum for a single family of caterpillars. A single specimen of *P. atalanta*, too bad to keep, was the only other Vanessa present. By the side of a very sluggish-looking stream (if indeed a "stream" at all), I took two specimens of *Pieris napi*, of the summer form, the only representatives of the species that I saw. *Pararge megera* was fairly common, the ragged remains of the first brood only on the 26th; these also continued to be on the wing on the 30th and 31st, but on the latter day a few very fresh ♂s of the second brood also appeared, the two broods thus overlapping. The same phenomenon occurred in the case of *Pieris rapae*, worn specimens of the spring form and fresh ones of the summer form being found on each occasion. This, I think, was also the case with *Coenonympha pamphilus*, judging both from the condition and the form of the specimens captured, but in this instance I am not perfectly certain, as I am in the other two. *Carcharodus alceae*, common, but mostly rather worn, completes the list of Rhopalocera.

But few Heterocera were observed. *Macroglossa stellatarum* occurred, but not frequently; *Arctia villica* was occasionally disturbed

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both from the hedge and from the vetch, and was particularly fine and fresh, *Coscinia striata* was also frequently started from the embankment, and May 31st gave me on the same ground a beautiful fresh example of *Deiopeia pulchella*. Of the Noctuids two species of *Acontia*, *lucida* and *luctuosa*, were common at one spot and appeared occasionally also elsewhere, and *Plusia gamma* provided three or four examples only. Finally, a burnet which I take to be *Zygaena loniceræ* occurred in some numbers on the top of the embankment.

The list of butterflies is not long, consisting only of two Hesperids, two Lycaenids, six Pierids, three Vanessids and three Satyrids, sixteen species in all; but the time available was very limited, and on one of my three visits, May 30th, the sun went in within an hour of my arrival; the available space was even more limited, being little more than a mile in length and at no point more than fifty or sixty yards in breadth.

The only two species which seem to call for special notice are *Epinephele jurtina* and *Coenonympha pamphilus*. The ♀s of the former were very large in comparison with the ♂s, but showed only slight inclination towards the *hispulla* form. The undersides of both sexes varied greatly in the number of spots on the hind wing and those of the ♀s varied also in colour; this sex was only just emerging and I only found five specimens (the ♂s being very common), but of these five the colouring of no two undersides was alike. The ♂s also varied much on the upperside in the amount of orange colouring round the apical eye-spot, which in some was barely visible, and in others formed a sort of veiled cloud extending two-thirds down the wing, while in one specimen there was an orange patch as conspicuous, though not so large, as that of the ♀. Another specimen was almost of the *semi-alba* form, and yet another of an intermediate shade.

In *C. pamphilus* the hindwings of the underside were almost unicolorous even in the ♀s of those which I take to be the remnants of the 1st brood, whilst the same wings on the upperside showed no trace of spots, the fresher specimens on the other hand, had generally a somewhat conspicuous whitish mark, more or less crescentic, on the underside of the hindwings, and showed traces of spots even in some of the ♂s on the upperside of the same wings, whilst in some of the ♀s they were very conspicuous. These had also, as a rule, a broader dark margin to all the wings, but as this feature was variable, and the colouring of the underside hindwing not quite constant, I am not certain as to the overlapping of the two broods in this species.

The Lido is a narrow island (or rather succession of islands) defending Venice from the Adriatic, but has far more the appearance of being mainland than any other part of the islands. Horses and carriages as well as motor-trams are much in evidence, though quite unknown elsewhere in the Venetian islands, where locomotion is either by water on the canals, or on foot in the narrowest of imaginable alleys.

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### List of Orthoptera and Neuroptera collected in the Eastern Pyrenees, with ecological notes.

By HUGH SCOTT, M.A., Sc.D., F.E.S.

(Concluded from page 126.)

24. *Mecostethus* [*Stethophyma*] *grossus*, (L.).—One ♀, taken in long grass in the same moist meadow with *Parapleurus alliaceus* and

*Chorthippus parallelus*, 19.VIII. When caught, the lighter parts were light yellow rather than green. A more northern species, occurring all over France, and widely distributed in Europe and N. Asia.

25. *Oedaløs decorus*, (Germar) (*nigrofasciatus*, De Geer).—One ♀, with some bright green colour dorsally, taken on the actual road to Fillols, below the dry, cistus-dotted slopes. A southern species (S. Europe, Africa), occurring over all France south of the Loire and recorded also from two departments immediately adjacent to Paris.

26. *Oedipoda germanica*, Latr. (*miniata*, Chopard et auctt., *neq* Pall.).—Abundant, but restricted to particular places, especially dry and stony spots: frequently settling on heaps of stones piled in one place, for repairing purposes, beside the road to Fillols. This species attracts attention in flight by the colour of the hindwings, the basal part of which is bright red, bordered externally by a dark band. In the series before me the prevailing tone of the cryptic coloration of the elytra, etc., varies from greyish to reddish-brown; it happens that one strikingly reddish specimen (♀) was taken on a patch of red earth, 21.VIII. Mr. Uvarov informs me (*in litt.*) that this Mediterranean species ranges as far east as Asia Minor, and extends rather far north in the western part of its range, but does not occur in European Russia or in other parts of Asia, records from these countries being due to confusion in the nomenclature.\*

27. \*+*Oedipoda coerulescens*, (L.).—Abundant in dry and stony places. Like the last, it has a cryptic coloration except for the hindwings, which are basally bright blue, with a broad dark band. All France: Europe, N. Africa, W. Asia.

28. *Acrotylus insubricus*, (Scop.).—Represented in the material only by two immature ♀♀. Chopard records it from a number of the far southern departments of France, right across from the Italian frontier to the Biscay coast: South Europe, Africa, Western Asia.

29. *Sphingonotus coerulans*, (L.).—I only found this species once (21.VIII.), right on top of the arid ridge across which winds the road to the village of Fillols; the ground was bare and very stony, and the tufts of cistus, etc., scanty. The insects frequented the bare stony patches, with which their cryptic colouring harmonised well. The hindwings are basally pale blue but with no dark band at all. This species was abundant in that one place, but the specimens were difficult to capture. Chopard records it from all France south of the Loire, and some other departments, even north of Paris: Central and S. Europe, N. Africa, Asia.

30. *Calliptamus* \*(*Caloptenus*) *italicus*, (L.).—Abundant: among a series of ten ♂♂ and eleven ♀♀, there are two ♂♂ and five ♀♀ of the form with two pale stripes along the lateral keels of the pronotum and extending on to the elytra, and two other ♀♀ in which there is a faint trace of these stripes. This species occurred in several different types of habitat; the ♂♂ were all taken in dry, stony, treeless places beside the Fillols road, 18-21.VIII.; while seven of the ♀♀ were taken, 24.VIII., on the very steep hillside east of the road to Casteil, some among bracken, broom, etc., the others at a higher elevation on the pine-needles which covered the ground beneath a wood of pines,

\* *Novitates Zoologicae*, XXX., 1923, p. 70.

which is at this spot without undergrowth. Found over nearly all France: general distribution, Central and S. Europe, N. Africa, W. Asia.\*

Some matters of interest can be deduced from the foregoing list. (i.) Northern species and Mediterranean species occurred to a considerable extent in different habitats, *e.g.*, the species taken among damp meadow grass, *Parapleurus alliaceus*, *Chorthippus parallelus*, and *Mecostethus grossus* are all, on the whole, northern, and the same may perhaps be said of those found among ling under pines, namely, *Pholidoptera griseoptera* and *Leptophyes punctatissima*; while Mediterranean forms, such as the species of *Oedipoda*, *Sphingonotus coeruleans*, and *Caloptenus italicus*, frequented hot, dry places. Of course there are some exceptions, *e.g.*, *Metrioptera albopunctata*, which extends fairly far north, was taken in dry, treeless places. (ii.) The northern and the southern species occurred (though in different habitats) within the same thousand feet of vertical distribution (2000 to 3000 ft. above sea-level): on the other hand, the fact that much higher elevations were not visited, doubtless accounts for the absence from my list of such forms as *Gomphocerus sibiricus*, *G. brevipennis*, *Stenobothrus bröhlemanni*, and *Stauroderus scalaris (morio)*, all of which are included in Azam's list from the Val d'Eyne, and which are recorded by Chopard as occurring (in France) at elevations above 1500 or 1000 metres (about 4900 and 3300 feet respectively). (iii.) All the species are forms of very wide distribution except *Ephippiger cunii* and *Stauroderus binotatus*, which are limited to parts of France and the Iberian Peninsula. (iv.) Remarks on cryptic coloration have been made under *Stauroderus biguttulus*, *Chorthippus pulvinatus*, and the species of *Oedipoda* and *Sphingonotus*. The grasshoppers provided a whole series of cryptically coloured forms: grass-green in the moist meadows; the brown of dead grass in *C. pulvinatus*, which occurred abundantly in dead grass; mottled browns, reddish tints, etc., in species that were found among low bushes with bare interspaces; and stone-colours in the species frequenting bare stony places. But I do not recall any great difficulty in seeing the insects, especially when they had once moved, however well they harmonised with the background on which they alighted. They were difficult to capture, but this was owing much more to their powers of swift movement than to their colouring. Probably the value of the cryptic colouring cannot be accurately gauged without more precise information than we at present have, as to what are the enemies of each species, and what powers of vision those enemies possess.

#### NEUROPTERA.

My records are very few, nor am I acquainted with any local list of the district. Xamheu includes no Neuroptera in his "Faune des Pyrénées-Orientales" (cited above), remarking on p. 208 that his material was too incomplete. My captures may be briefly listed as follows:—**Myrmeleonidae**: fairly numerous on the dry stony hills

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\* Among the voluminous literature on the bionomics of this species, notes on recent outbreaks in parts of France have been given by de Joannis and Falcoz, *Bull. Soc. Ent. France*, 1922, pp. 223, 315 respectively.

towards Fillols; *Macronemurus appendiculatus*, Latr., one ♂, four ♀♀ (a Mediterranean and South Russian species\*); *Nelees nemausiensis*, Borkh., one ♀, determined by C. L. Withycombe and confirmed by Mr. P. Esben-Petersen from a photograph of the wing; known from S. France, Spain, and the Canaries. **Ascalaphidae:** I saw only two specimens, of which I captured one; it proved to be *Ascalaphus longicornis*, L. **Chrysopidae:** *Chrysopa prasina*, Burm.; *Chrysopa walkeri*, McLachl., six examples, beaten in woods of small deciduous trees, oak or chestnut (Mr. Withycombe tells me that this species is known from S. France, Hungary, Eastern Europe, and the Caucasus [Suchum, 1911, Malcolm Burr coll.]). **Hemerobiidae:** *Boriomyia subnebulosa*, Steph., *Hemerobius lutescens*, Fabr., and *H. stigma*, Steph.; the Cambridge Museum also contains two examples of *Megalomus tortricoides*, Ramb., taken at Vernet in June, 1891, by Dr. Sharp, while he and Mr. Champion were staying with Monsieur Oberthür. **Panorpidae:** *Panorpa meridionalis*, Klug., several ♂♂ and ♀♀ were taken in shrubby places and deciduous woods, and the Cambridge Museum also contains examples taken at Vernet by Dr. Sharp, VI.1891; this beautiful species is striking from the deep black of the wing-markings; it is recorded from Central and S. France, Pyrenees, Spain, Portugal and Rumania (*Cat. Coll. Selys*, Fascic. V., part 2, p. 24, 1921); no other *Panorpa* was seen.

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### Old haunts re-visited—Wicken and the Deal Sandhills.

By RUSSELL JAMES, F.E.S.

After an interval of ten years, I determined to renew my old acquaintance with Wicken Fen, the attraction being the greater as the district was—entomologically—new to my son. In order to have a larger scope we did not stay in Wicken itself, but hired an "Enfield" motor-cycle and side-car and made our headquarters in a small village not far from Mildenhall.

A side-car machine is a great asset in collecting as you can cover so much ground and get right on to the desired spot with your paraphernalia—light, sheet, etc.

I was very anxious to see how Wicken Fen fared under the management of the National Trust, and I may say at once that the impression I brought away was entirely good. The fen growth appears to be well and intelligently controlled—the bushes allowed to remain and thicken near the main drove and kept clearer away back.

Here there are large open reedy spaces in varying stages of growth, where the Milk Parsley flourishes and *Papilio machaon* larvae abound in numbers far exceeding anything I have known in the past.

This species is partially protected. None of the village people are allowed in the fen, where formerly *P. machaon* larvae were collected wholesale by village boys. Each visitor is allowed to take up to a dozen specimens in either egg, larva, pupa or perfect state. I should

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\* The distribution of these two species of *Myrmeleonidae* is cited from Esben-Petersen's "Help-notes towards the determination of the European Myrmeleonidae," *Ent. Meddelelser*, XII., part 2, pp. 97-127, 1918.

have thought that a graduated scale might have been better—more eggs and fewer full grown larvae, pupae or imagines. However the butterfly can well protect itself and the pupa conceal itself; it is as a larva that the danger exists—it is so conspicuous if you know where to look. After all, its present numbers seem to prove that the arrangement is a good practical one.

With this exception there is no restriction put upon the bona-fide amateur entomologist, although Barnes, the fen watcher, gives one the impression that he is a watcher in a real sense and would allow no nonsense.

He is also adamant in refusing access to the fen to anyone not provided with the official permit of the National Trust.

I think it would be well possibly to protect *Eutricha quercifolia* in some measure. This species has also suffered from over-collecting in the past at the hands of the locals, and does not seem to be recovering. We had no suitable nights at light ourselves and did not see it, but from enquires made I believe it is becoming a comparative rarity, while in days gone by I have seen a couple of dozen or more in a night. With this exception and possibly a waning of *Nascia ciliaris* the fen fauna seems very healthy.

Our four nights, with bright clear skies and nearly a full moon, were no criterion—although treacle was on strongly—but I met others and compared notes, and all the old species are doing well. *Leucania obsoleta* seems to be slowly increasing, *Arsilonche alborensa* is going through one of its plentiful phases and *Phragmatoecia arundinis (castaneae)* has maintained its largely increased numbers which were apparent ten years ago.

According to one gentleman *Senta maritima* seems to have gone again, but then this was never an old Wicken species, and only put in an appearance very sparingly about 1905—although common locally at Ely.

As I mentioned, the four nights we spent in the Fen (July 24th, 26th, 28th, and 29th), were bright with a full moon—a chill coming on early from rapid radiation after a hot sun. A number of moths flew at dusk—prominently *Nudaria senex* and *Scoparia pallida*. As the late Mr. Tutt said years ago, *N. senex* in numbers at dusk nearly always heralds an entomological collapse after dark, and so it proved.

It is true that on the 28th with the moon clouded over we had a little run on the sheet from half-past ten till eleven, but after that it fizzled out entirely.

*Hydrelia uncula* appeared the moment the lamp was lit, followed immediately by *Cosmotriche potatoaria*—the capture of the evening—as it was a very fine specimen of the pale yellow male variety; only the third I have ever taken at Wicken. Two other typical males came along, some “wainscots,” *Lithosia griseola*, *Acidalia immutata*, *Nudaria senex*, *Chilo phragmitellus*, etc., and then the chill air came along and flight ceased.

On the 29th again a few moths came including *Phragmatoecia arundinis (castaneae)* and odd specimens of *Paraponya stratiotata*, *Rhodophaea advenella*, and *Chilo forcicellus*.

At dusk *Epione apicaria*, the pale fenland *Cidaria testata*, and *Chilo phragmitellus* (including two females) were in plenty and a few *Acidalia immutata* and *Caenobia rufa*. The buckthorn feeders, *Scotisia*

*rhamnata* and *S. vetulata* were practically over, and *Collix sparsata* quite so.

Moths swarmed on treacle each night but the vast majority were *Apamea secalis* and *Xylophasia monoglypha*. A couple of fresh *Agrotis obscura* were taken and some fine *Leucania straminea*. *L. pudorina* were still good and plentiful and *Apamea leucostigma* and *Calania phragmitidis* just coming out. *Tapinostola hellmanni* were also out, turning up very late as usual. *Caradrina alsines* and *C. taravaci* were in moderate numbers and a fine variable lot of *Agrotis nigricans* were taken.

A few each of *Cleocérés vinivalis*, *Mania maura*, *Calymnia affinis*, *Triphaena interjecta* and *Cerigo cytherea* made a pretty large bag and the mixture of the seasons was shown by a belated *Meliana flammea* and some fresh *Noctua festiva* occurring among such August species as *A. leucostigma* and *C. phragmitidis*.

A few poor *Herminia cribralis* were netted and odd larvae of *Saturnia carpiui* and *Arsilonche albovosa* picked up.

I examined a lot of *Thalictrum flavum*, which is now very abundant in the fen; but found no *Cidaria sagittata* larvae.

We did not get time to visit its old quarters in Burwell Fen, where I found it so plentiful in 1899, but I was pleased to hear from a visitor, that it had occurred this year in a locality some miles away.

So much for Wicken.

An evening at Chippenham Fen hardly did it justice, as heavy rain had occurred in the afternoon and again late in the evening. Few moths flew at dusk, but we took *Toxocampa pastinum*, *Hydrelia uncula*, a nice *Coremia quadrifasciaria*, and a fair lot of *Rivula sericealis*. Treacle produced not a single moth—probably owing to the masses of ragwort. There were lots of moths at this bloom—mostly *Agrotis nigricans*, but the rain was now so heavy that we did not look very closely.

When we reached the side-car, we appeared to be landed in the Fen for the night. It was the first day of our trip, and hitherto we had only started the engine when it was warm. Being now stone cold it defied our utmost efforts. As a matter of fact although we did not know it at the time, the priming taps were carboned up and when we imagined we were flooding the cylinders, no petrol was getting through. At last in despair, we decided to push it along the grassy lane for nearly half-a-mile on to the main road, and here with the aid of a slight hill we got it started.

We visited Chippenham again the following afternoon in the hope of a belated *Bankia argentula*—a species my boy had never seen alive—and succeeded in walking up two quite good females.

We also took some fresh *Crambus selasellus*, more *Rivula sericealis*, *Pyrausta aurata*, a few *Acidalia immutata*, and one or two *Triaena psi* and a *T. tridens* on tree trunks. I never have great difficulty in distinguishing these species. Although almost impossible to describe in words, there is a "look" about *tridens* that is generally unmistakable. I imagine it to be in the scaling, but it has what I should describe as an oily appearance on the wings—something like what *Leucania favicolor* is to *L. pallens*, but in a less degree. Chippenham generally seemed to have a great dearth of insect life—in fact this dearth of insects by day, was a characteristic of our whole holiday.

On the morning of this day (July 24th) and again on the 29th, we visited an old locality for *Dianthoecia irregularis*. To my grief I found that the place where *Silene otites* used to grow most freely, had been partially cultivated and the whole of the food-plant destroyed. Small patches occurred on the other side of the road over a wide area, and here *D. irregularis* larvae occurred in some numbers and among them two *Heliothis dipsacea*. *Adopaea lineola* used to occur commonly on this spot, but to my surprise every skipper netted this time proved to be *A. flava* (thūmas).

We treacled over this ground one night and worked the knapweed and bugloss blossoms. *Agrotis nigricans* was plentiful on the flowers and *Miana bicoloria* swarmed, but little beside, and treacle only attracted a dozen moths or so—among them *Cerigo cytherea* and *Miana literosa*. A single *Oxyptilus pilosellae* was taken off knapweed.

Another day was devoted to a run over to Bury St. Edmund's for larvae of *Eucosmia certata* and *Anticlea berberata*, both of which I have formerly taken nearly full-fed at this date. The barbary hedge had been cut close which made beating difficult, but we took all the *E. certata* we wanted—smaller than usual—but no sign of *A. berberata*. At the very end of our time, however, we beat out a freshly emerged imago. This prompted a visit at dusk two evenings later (July 27th), when a long series was taken. Why one species should be later than usual and another feeding on the same foodplant in the same lane a fortnight early I do not understand. Not much else occurred except quantities of *Camptogramma bilineata*, but odd specimens of *Iodis vernaria*, *Eupithecia subfulvata*, and *Acidalia emarginata* were netted. We treacled a large group of elms on our way, to examine coming back in hopes of *Calymnia diffinis*, but not a single moth was attracted. As at Chippenham there was too much ragwort about. A couple of pupae of *Cucullia verbasci* were scraped up at the roots of a much eaten mullein en route, and throughout our stay seed-heads of the White Champion produced numbers of *Dianthoecia* larvae—mostly *D. carpophaga*, but a fair lot of *D. cucubali* and probably *D. capsicola* among them.

The morning of this day was given up to a hunt for *Lithostage griseata* larvae which proved entirely successful. The extreme localness of this species is marvellous.

There is one field where I have always taken odd specimens of the moth in June and some numbers in 1905. Now after eighteen years in the same field we found a larva on almost the first plant of *Sisymbrium sophia* examined—practically full-fed—and this was followed by many more. They mostly pupated at once, and probably many had already gone down.

The full-fed larva is fairly conspicuous but the smaller ones, of which we found a very few, are wonderfully protected by their similarity to the spikey seed-pods on which they feed.

The larvae by no means occur wherever the food-plant is and we only found them on two spots. On the same ground we took a specimen each of *Agrophila sulphuralis* and *Spilodes sticticalis*—both new to my boy—and evidently cases of retarded emergence, as both were beautifully fresh. The one exception to the general dearth of moths by day was *Strenia clathrata* which abounded everywhere.

Odd *Crambus pinellus* and *Hecatera serena* were picked up and these completed the list of captures for the week. We had taken most things that we came for except *Eutricha quercifolia* and one or two unexpected, such as *Heliothis dipsacea* larvae and *Corœmia quadrifasciaria*—the latter in my experience always hard to get.

(To be concluded.)

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### Geographical Variation in *Hipparchia semele*, L.

By ROGER VERITY, M.D.

This species produces several distinct races, the most highly characterised of which are found chiefly on the outskirts of its area of distribution, whilst others, more or less intermediate, exist in intermediate regions. My first attempt, however, to detect the fundamental lines of variation in connection with the features of these races, and to classify them accordingly, so as to show as naturally as possible their relationships, left me for some time in much perplexity, because individual variation, producing also in most regions local variations restricted to limited areas, is so great as compared with the total scale of variability of the species, that for some time I failed to detect any character affording a sufficient amount of constancy and regularity to be reliable as an index. At last I grasped the fact that there does exist one, but that to follow it one must take into account an interesting phenomenon; which *semele* exhibits to an extent, I am not aware of, in this special way, in any other species. The leading feature is the network of fine streaks running in a perpendicular direction to the nervures on the underside of the hindwings; on broad lines these may be stated to be thick and densely packed together on the entire wing, or most of it, in forms, whether individual or racial, of damp localities and especially of northern ones; these streaks on the contrary become, as a result of dryness and especially in the south, gradually thinner and set further apart, and they get obliterated on certain zones of the wing. These zones, as a result, become broader and broader, and the chief of them, and the first to appear, is a band-like space running across the wing just beyond the end of the cell; it is nearly invariably outlined internally by the sharp streak present in most *Satyridae* at this level. Besides the network just described the dark pattern of the underside of the hindwings also consists in a lighter coloured brownish gray suffusion, which first makes its appearance between the two central streaks and along the line of eye-spots, in separate patches; these then spread and blend together, and may end by covering the entire wing. The network and the suffusion are usually both present, but their comparative development varies very much, and we shall see that some extreme races are characterised by the total, or a considerable, obliteration of one of the two. On broad lines one may say that the network is more developed in northern races and the suffusion in most of the southern ones. The important phenomenon, mentioned above, one must, however, bear in mind to be able to follow the main lines of variation of this species is, that in most regions it produces two forms so different from each other as to stand near the opposite ends of its scale of variation. What is more, the majority of individuals belong distinctly either to one or to the other, and intermediate forms are comparatively scarce; this takes place so markedly that as a rule

one form only is produced locally, whilst in a spot a few miles off only the other exists; thus each region exhibits two parallel races, and the two lines of variation are met with over the greater part of Europe; here and there the two forms are found together and with transitional ones. This interesting phenomenon is evidently a tendency of *H. semele* to split into two subspecies, somewhat as *Nytha fagi* produces locally either nymotypical *fagi* (= *alcyone*), or *major* (= *hermione*), or transitional races, and somewhat as *Erebica ligea* produces *ligea*, or *philomela* (= *euriale*), or transitions. The two extreme lines of variation of *H. semele* can be described as follows:—

Line A: Fulvous areas of upperside in both sexes very extensive, but usually of a rather cold yellowish tone; in the male the forewing, as well as the hindwing, is crossed by a broad band of uniform colour. On the underside of the hindwing the diffused dark shadings tend to be pale and limited in extent, or even nearly absent; so that, when the dark network is thin, the white ground-colour remains uncovered, and usually a broad band-like space of this colour is to be seen across the whole wing.

Line E: Fulvous areas of upperside in both sexes; but especially in the male, very reduced, usually of a warm, reddish tone; in the male the forewing often lacks all traces of fulvous; as a rule there are two or three spots of it; very limited in extent, just outside the eye-spots; on the hindwing of both sexes all that is left is a series of separate spots, arrow-headed in shape and of a very intense reddish fulvous; the rest of the band is only vaguely shadowed by a whitish clouding. On the underside of the hindwing the gray or brownish-gray suffusion, described above, tends to be very extensive so that, when the network is thin or obliterated, the wing remains darkened all the same; the white band-like space may exist, in northern races especially, but it is narrow, and more often it only exists on the fore part of the wing; in extreme southern ones it is nearly or entirely abolished.

When the existence of these two lines of variation has been grasped, the classification of the majority of the races works out naturally and easily, as successive grades along them. A few races, however, stand apart and do not fall in with those of either line, evidently being quite as distinct from both as these are from each other. I think the most correct way of expressing their relationship to them is to designate them as three other parallel lines, as I will endeavour to show clearly by a synoptic table at the end of this paper which will also help to understand the following descriptions.

Line B. I will thus call the line of race *aristaens*; Bonelli, which contains no other, so that its grades simply consist in the individual variations of this one race. These however are so broad that they make up for it by covering entirely the corresponding grades of the other lines. I have found it well worth preserving in my collection a series of 147 males and of 41 females, to show the extent of variation in a single locality on Mt. Capanna, in the Isle of Elba, where this race is found, besides Sardinia, whence it was described, and Corsica. The characteristic of this line is that it combines the upperside characteristic of line A with the underside one of line E. The extent of fulvous is, in fact, even greater than in any race of line A, on an average, whereas the extent of dark suffusion on the underside is usually such that the white band-like space is always very reduced and

often entirely abolished, as in line E. The extent and the thickness of the network of the underside is so variable that it runs from the heavy and complete one of grade I, recalling the northern *scota*, to its nearly total obliteration, as in the southern *mersina* or *algerica*, so that the wing is then of a uniform grayish brown, due to the suffusion. It is noteworthy that this combination of an extremely reduced upperside dark colouring with a very developed underside one, is the very characteristic of race *tigelius* of *Pararge megera*, L., which is found in the same localities, and which also deviates from the more usual continental line of variation on this account. Other characters which *aristaeus* has in common with line E are the tone of the fulvous; very bright and reddish, and the fact that on the forewing it is usually much less extensive than on the hindwing. A peculiarity of this race is the way that colour shades off gradually towards the base of the wing, which it often reaches, especially on the hindwing, whereas in the other broadly fulvous ones it always ends sharply, forming a band.

Line C. We must, I think, consider this line on account of a feature exhibited by race *algerica*, Obth., of North Africa, which is never found in any other race even as an individual variation, so that it cannot be placed in the other lines; the fulvous spots on the forewing of the male are similar to those of the female of all the other races, (except *aristaeus* and *siciliana*), because the fulvous band is wide and sharply outlined, but broadly interrupted by a dark band on the third median nervure. On the hindwing the band is also broad, as in line A, and its tone of colour is often cold, as in this line; on the underside of the hindwings, on the contrary, the dark suffusion is very broad-spread, as in line E, only leaving, as a rule, a narrow and irregular white band uncovered, and it is of a characteristic warm chestnut tinge, not veiled with black, because the dark network is always extremely reduced; *algerica* constantly corresponds to the last grade in this respect, and contrasts with *aristaeus* by its very limited individual variations. A peculiarity is the sharpness and intensity of the two black streaks, which cross the underside of the hindwing; they are broken by unusually sharp angles; they are more accentuated also on the forewing. In some females the extent of the fulvous on the upperside is considerable, and there is a diffused patch of it in the middle of the wing, as in race *siciliana* and in the less highly characterised *aristaeus*. This African race is remarkably small. Rothschild remarks in *Novitates Zool.*, XXI, p. 308 (1914), that the form found at Guelt-es-Stel, in Central Algeria, "is very brilliant, considerably more so than the series from Blida, Les Glacières." I notice, in fact, a remarkable difference between a series I have from Lambèse and the specimens of Sebdo and Géryville, figured by Oberthür in *Ét. Lép. Comp.*, X., fig. 2317-21. The former are very much less conspicuous: the fulvous is dull and cold in tinge, and so limited in extent that some females on the upperside differ in no way from the *jubaris* and nymotypical *semele* of Central Europe. As Oberthür, in the few words of his original description of *algerica*, in the *Ét. Ent.*, I, p. 27 (1874), gives "Daya, Lambèse, and Collo," as localities for it, I conclude he had both the dull and the brilliant races before him, and I propose restricting his name to the one he figures in 1914, and naming the Lambèse and Blida one *PALLIDALGERICA*, mihi.

The races of the Iberic zone seem, on the whole, to constitute a

gradual transition from those of France to *algirica* of Africa, just as might have been expected, and as in the races of many other species. I cannot pretend to work them out thoroughly here, because it would need considerably more material than I have at hand, but I can state that the race of Cuença in Nueva Castille and of Canizares is distinctly intermediate, and that other specimens I have from Barcelona are more similar to the French races. The Cuença race stands well apart from any other European race I have seen, and points to *algirica* by the following characters: small size, elongated and narrow wings; apex very pointed, outer margin straight; distance between the nervures less than in the Italian and other southern races, so that in the female the fulvous spots are lesser in extent; the latter are also rather dull and cold in tinge, with a shaded outline, very different from the bright, clear, clean-cut spots of the more eastern races of the south, and resembling more the northern ones in this respect. In the male these fulvous spots are not perceptible enough to show if they exhibit the characteristic female-like features of *algirica*: I presume this would show better in the races of Southern Spain. What is important is that the underside of some individuals has most markedly the same aspect as that of *algirica*, whilst no other European race exhibits it even as an individual variation. I propose for this race the name of *HIBERA*, mihi.

Line D consists in a combination of characters which diverge from the more usual ones of lines A and E in a way exactly opposite to that of the *aristaens* line B; in D, in fact, the fulvous markings of the upperside are limited in extent, as in line E, but their tinge is pale and cold as in A, and the underside of the hindwings also resembles A. I know two races which afford these features. At high altitudes in the Sibillini Mts. (Marche in Central Italy), in alpine surroundings, a distinct mountain race is produced, which I propose calling *APENNINIGENA*: size as small as the English race; fulvous of upperside pale yellowish in tone, as in the nymotypical *semele* of the north, and the extent of it also similar to it in both sexes; eye-spots remarkably large; underside of hindwings very light, rather like race *teres*, and belonging to line A rather than to E by its light gray and limited suffusion, which in the males leaves a broad white area free.

I do not know the Greek race described from the Taygetos as *sestes*, Frühstorfer (*Int. Ent. Zeit.*, April, 1908, p. 11), but his description of an upperside, "very poor in pattern," females with "a dull, pale, ochre yellow and very narrow band on hindwing," and of an underside "not much darker than in *teres*, and with a median band nearly as broad," suggests features similar to those of *apenninigena*; its size, however, is said to be large. This is presumably the hinterland race, most widespread. No doubt, however, more than one race is produced in the Balkanic zone. Staudinger in *Horae Soc. Ent. Ross.*, VII., p. 68 (1871), for instance, records a different one from the Isle of Naxos, which he describes as transitional to *aristaens*.

(To be concluded.)

## NOTES ON COLLECTING, etc.

*ABRAXAS GROSSULARIATA* VAR. *NIGROAPICATA*, ETC.—To prevent confusion in the future, it seems desirable to point out at once, that

the form of *A. grossulariata* to which in the current number of the *Ent. Record*, p. 140, the Rev. G. H. Raynor has applied the name *nigroapicata*, was described by myself in the *Ent. Mo. Mag.* of June 1921, p. 135, under the name *melanapicata*. The form occurs here occasionally in a wild state, and I have several of it in my series, including one covered with the var. *nigrosarsata* spotting. The distinguishing character of what I take to be Raynor's var. *antemarginata* occurs here frequently in my var. *lunulata*, and I have quite a number of specimens of it—in my specimens, however, the black marginal band is of almost uniform width throughout, and not broader in the upper half as described by Raynor. Of var. *aberdoniensis* I have some of the late Arthur Horne's specimens, in which the "oblong patch of white" (along with the other pale portions of the forewings) is deep yellow, and of which form I believe Horne used to breed many. Of var. *nigrocratacea-varleyata* I have a beautiful specimen, bred and sent to me by the late Hon. H. Onslow, in which the white areas are replaced by yellow, except the basal portion of the hindwings, which remains white.—GEO. T. PORRITT (F.L.S., F.E.S.), Elm Lea, Dalton, Huddersfield, September 25th, 1923.

A HABIT OF *MACROGLOSSA STELLATARUM*.—A few days ago I watched a specimen of *Macroglossa stellatarum* hovering at the common fuschia in the Botanical Garden here. It did not approach the flowers from the open part among the stamens but thrust its tongue between the petals at the base. From its behaviour it seemed that the moth could discover exactly where the nectar lay by placing the tip of its tongue close to the flower.—ALFRED SICH, Zurich, September 16th, 1923.

ABUNDANCE OF *PYRAMEIS ATALANTA*.—On several occasions this month I have seen *P. atalanta* basking in the sun and revelling in the taller flowers in the herbaceous borders of many gardens. But to-day I was delighted to find a very secluded woodland meadow, quite blue with the flowers of scabious and luscious undiscovered blackberries, where there were large numbers of the "Royal William" in all its beauty. Among them was a solitary *Aglais urticae*, a "white" or two, and several *Plusia gamma*. The *P. atalanta* seemed to be spread over the whole field.—H.J.T., September 28th.

*LAPHYGA EXIGUA* AT MUCKING.—On September 6th, I took at sugar a much wasted specimen of *L. exigua*. I have not seen this species alive since 1906, the great *exigua* year.—Rev. C. R. N. BURROWS (F.E.S.), Mucking, October 4th, 1923.

*DINODERUS OCELLARIS*, STEPH., IN BRITAIN.—In August last while staying at the Wellington Hotel, Wellington College Station, I captured a small beetle which I found crawling on a table under the open window in my dressing-room. My friend Mr. Donisthorpe, was good enough to examine it for me, as I was unable to identify it. He has informed me that it is an example of *Dinoderus pilifrons*, Lesne. He has also given me the following account of this species.—"In the supplement to Fowler's *Brit. Col. Dinoderus ocellaris*, Steph.=*D. pilifrons*, Lesne, is stated to be cosmopolitan; Europe, India, Indo-China, Philippine Islands. There are also specimens in the Brit.

Mus. from Japan and Hong-Kong which probably belong to this species. The only British examples which have been recorded are in the Power collection, labelled "Darenth, Lewis," and one mentioned by Stephens as taken at Little Chelsea, in July last, by Mr. Westwood. It is probably exotic, having been found in a cup of coffee." Mr. Donisthorpe says that *D. ocellaris* is distinguished from *D. minutus*, F. (the species taken by Professor Beare in the wood of an old paper-basket at Richmond) by the central foveae of the thorax being obsolete, and the frontal region being furnished at the ends with upright thick and rather long hairs. The funiculi of the antennae are also furnished with similar hairs to those on the frontal region. In the *Ent. Record* (16.12.1900) Mr. Donisthorpe pointed out the confusion that has hitherto existed with regard to the *Dinoderus substriatus* of our British collections; and he stated that as a matter of fact we possess three species, viz:—

1. *Dinoderus minutus*, F.
2. " *ocellaris*, Steph. = *pilifrons*, Lesne.
3. *Stephanopachys substriatus*, Pk.

I am much indebted to Mr. Donisthorpe for his kindly assistance, and for the full information which he has been good enough to afford me concerning my very interesting capture.—R. S. MITFORD, September 20th, 1923.

*LIXUS ALGIRUS*, L., AT FAIRLIGHT.—On the 10th inst., Mr. Bennett was good enough to accompany me in an expedition to Fairlight in search of *Lixus algirus*, L. We found it in its old locality, and were able to take a nice series of this fine beetle.—R. S. MITFORD, September 20th, 1923.

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## CURRENT NOTES AND SHORT NOTICES.

Four fresh parts of the *Genera Insectorum* have just been distributed to the subscribers. Part 174c, Hymenoptera: *Formicidae* (*Myrmicidae*) completed, by C. Emery. Part 179, Lepidoptera-Heterocera: *Carpocapsinidae*, with 1 col. plate, by E. Meyrick. Part 180, Lepidoptera-Heterocera: *Oecophoridae*, with 6 col. plates, by E. Meyrick. Part 181, Hymenoptera: *Apidae* (*Prosopidinae*), with 1 col. plate, by Geoffrey Meade-Waldo.

May we remind our readers that the South London Entomological Society's Annual Exhibition takes place at their rooms, Hibernia Chambers, London Bridge, on November 23rd. All visitors are heartily welcome, and are free to bring exhibits.

The *Ent. Mitt.* of the Deutsch. Entom. Inst. Berlin-Dahlem contains a few short remarks on current entomological items of interest which give food for earnest thought, by the editor Dr. Walther Horn; an article on Entomology in Russia and another on the Russian Zoological and Entomological Congress of 1922; O. John writes an account of Viviparity in the Thysanoptera; with other items, and reviews of New Literature.

Reports from Royston are everything that those who went down could wish to make. It is stated that remarkable aberrations of all sorts were as plentiful, if not more so, than ever before. Already they

have begun to appear in our societies exhibits. Last year we referred to a nefarious method of collecting that was reported to have been indulged in at Royston. A most reliable witness this year assures us that there was scarcely any sign of what occurred so openly last year.

Recent numbers of the *Canadian Entomologist* have contained a series of charts illustrating the records of a Trap-lantern at Ithaca, N.Y., in which the waxing and waning of the brood as well as the sporadic appearances of early and late emergence is well shown. A series of notes accompanying the record add other details and point out the apparent reasons for certain irregularities of appearance which appear in the case of some species.

In the *Irish Nat.* is the record of a new butterfly to the island. In June last a specimen of *Brenthis euphrosyne* was captured in Co. Clare and sent to the National Museum. It was in company with *Euchloë cardamines*, *Pararge aegeria*, *Epinephile jurtina*, *Coenonympha pamphilus*, *Cupido minimus* and *Polyommatus icarus*.

An important paper by Stauder is running through the pages of the *Zeit. für wissen. Insektenbiologie* on the Butterfly Fauna of the Illyro-Adriatic Coast and Island Zone, illustrated with map, plates and text-figures. This area has a most interesting fauna and flora and very little has been done to investigate it. During the present year a very successful expedition was made by Dr. Zerny and Fritz Wagner to South Dalmatia. In the same magazine H. Stichel is writing contributions to our knowledge of the *Riodinidae* (*Erycinidae*) of South America.

In the *Ent. Rund.* for September, Dr. Seitz completes his notes on Mt. Everest and the Southern Boundary of the Palaearctic Region and also contributes an article on Insect-life in the Pyrenees, dealing with all orders but mainly with the Lepidoptera.

An important study of the species of North American Tortrices of the subfamily *Eucosminae* has been prepared by C. Heinrich at the suggestion and with the advice of August Busck. It is mainly based upon a morphological investigation and is illustrated by no less than 432 figures. There are 26 genera recognised of which 9 are described as new, and 382 species are dealt with of which 69 are new. The revision is based upon the material in the U.S. National Museum, the American Museum of Nat. History and Dr. Barnes collections. In the classification the hitherto dominant Heinemann system has been discarded, as well as all genera dependent upon secondary sexual character. Respecting synonymy some of the more recent advances are not recognised. The author writes "In separating the genera, I have considered as nearly as possible all the external structural characters of the moth. My purpose has been to arrange the species in their natural order, putting together those most alike in their genitalia structure and general habitus, and separating them into groups according to their development from the generalised type. These groups I have designated as genera, defining them on any characters that would serve to identify them."

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## SOCIETIES.

## THE ENTOMOLOGICAL SOCIETY OF LONDON.

June 6th.—OBITUARY.—The Chairman announced the death of Canon W. W. Fowler, a past President of the Society, and a vote of condolence with his relatives was passed.

EXHIBITIONS.—Mr. J. F. Green exhibited and made remarks on Butterflies from the South of France.

Mr. H. Mace exhibited Butterflies from the neighbourhood of Khartoum and said that there is evidence of species being recently introduced there from further up the Nile.

Dr. G. D. Hale Carpenter made remarks on *Pseudacraea eurytus* and its models in Eastern Uganda, and showed specimens and lantern slides in illustration of them.

Mr. C. B. Williams exhibited Nemopterous larvae from Egypt and some photographs of the type of country in which they are found. He also exhibited photographs of native bee-hives and of an incubator for testing the effect of different temperatures on insects.

Professor E. B. Poulton, F.R.S., exhibited a remarkable male of *Papilio dardanus*, Brown, and showed a number of lantern slides illustrating the occurrence of reciprocal mimicry between three indigenous Fijian Euploeine Butterflies and an invading *Euploea*.

## THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

June 14th 1923.—Mr. Brown, on behalf of Miss Cheesman, exhibited specimens of *Pyrophorus* (Col.) from Trinidad, and stated the cause of the light to be the oxidisation of the digestive fluid and the fat-bodies.

Mr. Leeds, a larva of *Strymon pruni* about to pupate, partly eaten by another larva.

Mr. Bunnett, *Cryptocephalus parvulus* (Col.) from Oxshott.

June 28th.—Mr. S. N. A. Jacobs, of Catford Hill, S.E. 6, was elected a member.

Mr. Hugh Main, cocoons and a living female of *Heterogynis penella* from St. Martin Vésubie; *Ascalaphus ottomanus* (Neur.) and a Nemopterid larva with elongate prothorax from S. France.

Mr. Blenkarn, *Cryptocephalus nitidulus* from Mickleham.

Mr. Parker, a bred *Mimas tiliae* of a very variegated rich red-purple coloration.

Mr. Cheeseman, two *Argynnis aglaia*, one with dark brown suffusion in the green areas of the underside, the female with an excess of deep black areas on the upperside.

Mr. Bunnett, on behalf of Mr. Pizey, a collection of Butterflies and Moths and other insects illustrative of the fauna of Ceylon; he also showed *Ephestia ficulella* bred from chocolates.

Messrs. O. R. and A. de B. Goodman, T. H. L. Grosvenor and Hy. J. Turner, a large number of European and Eastern Argynnids to illustrate Mr. O. R. Goodman's paper.

Mr. O. R. Goodman read a short paper initiating a discussion on the "Three Larger British Argynnids."

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*Desiderata*.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—W. G. Pether, "Thelma," 4, Willow Bridge Road, London, N. 1.

*Duplicates*.—*Aglaia*, *Adippe*, \**Io*, *T. quercus*, *Coridon* vars., \**Fuliginosa* (Reading), \**B. quercus* ♀, *Tilia*, *Menthastri*, \**Linariata*, *Aurantaria*, *Leucophæaria* vars. *Paniscus*. *Desiderata*.—Pupæ of *Dictæoides*; Imagines of typhon, *palpina*, *camelina* (dark), *Curtula*, *Pyra*, and numerous others; Ova of *Hispidaria*.—Harold B. Williams, 112a, Bensham Manor Road, Thornton Heath, Surrey.

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## MEETINGS OF SOCIETIES.

**Entomological Society of London**.—41, Queen's Gate, South Kensington, S.W. 7, 8 p.m. October 17th.

**The South London Entomological and Natural History Society**, *Hibernia Chambers*, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. October 25th, Mr. R. Adkin, F.E.S., Paper—"White and Buff Ermines." November 8th, Mr. T. H. L. Grosvenor, F.E.S., Paper—"Nat. Hist. of the N.W. Provinces of India."—Hon. Sec., Stanley Edwards, 15, St. German's Place, Blackheath, S.E.3.

**The London Natural History Society** (the amalgamation of the City of London Entomological and Natural History Society and the North London Natural History Society) now meets in Hall 40, Winchester House, Old Broad Street E.C. 2, first and third Tuesdays in the month, at 6.30 p.m. Visitors welcomed. Hon. Sec., W. E. GLEGG, 44, Belfast Road, N. 16.

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## Old haunts re-visited—Wicken and the Deal Sandhills.

By RUSSELL JAMES, F.E.S.

(Concluded from page 153.)

A night at home on the 30th, and then off to Deal for five days to renew acquaintance with another favourite and historic haunt—the Deal Sandhills. How Mr. Tutt loved these sandhills in the “eighties” and how bitterly he “cursed” the coming of the golfers. I am inclined to think after a lapse of 30 years or so that the golfers are not an unmixed evil, even from the entomological point of view. It is true that the construction of the greens practically destroyed *Acidalia ochrata* and *Nola centonialis* as British species, but the course on each side of the fairways remains in its natural state, and is a safeguard against building development. It is still a wonderful collecting ground and with the exception of the above species, retains most of its old-time riches, including plenty of *Lithosia lutarella* race *pygmaeola*. In fact, I am not at all sure that *A. ochrata* does not still survive in small numbers. We were too late for it, but I know it still occurred a few years back further along towards Richborough, and is probably somewhere in the neighbourhood. None of the three nights we spent there were of the still, breathless type that *pygmaeola* loves, but yet a very short search with hand-lanterns between the treacle rounds gave us all we wanted at rest on the grass culms. Only one was seen to fly and curiously enough much the larger proportion seen were females—quite reversing the usual order of things. A few late *Mesotype virgata* were taken at the same time and Noctuae were on the grasses also, but they were in such countless myriads at treacle that they did not make it worth while to spend time searching for them. The numbers on treacle each night were immense, but the middle night of the three (August 3rd) was the night of nights.

I have not seen such a vast crowd anywhere since 1910—in fact I don't know that I have ever seen its equal. Not only was each post crowded to its full length, but the long grass at the foot was full of moths, and new arrivals buzzed around all the time. There was a strong warm wind from the west, but whether it was due to this or to the new substitute for treacle that we used I do not know, but neither of the other nights—although good—equalled this one.

By this treacle “substitute” hangs a tale. We arrived at our ground about 8.30, opened our new tin of “supposed” treacle and behold! custard powder!! The grocer had substituted another purchase for our own. However, I was not going to relinquish our night's work without an effort. Close by our ground, situated midway between the Deal and Sandwich Golf Courses, is a small colony of large private houses and a high-class hotel. They are built on the site of the old coast-guard cottages, which used to be almost the only sign of habitation in the whole wild sweep between Deal and the Stour Mouth. I am told that the colony is sometimes referred to as “Millionaire's Corner.” At the risk of being taken for a tramp in my very oldest fen-working attire, I determined to try the hotel for treacle. So I got my boy to run our “Enfield” in among the Rolls-Royces and other cars, and after getting past the luggage porter was received

NOVEMBER 15TH, 1923.

by the manager with most sympathetic courtesy. There was no treacle available, but in response to my appeal for anything "sweet and sticky," he produced a supply of glucose. This I thinned down with water, methylated spirits and plenty of pear essence into the running liquid which produced such record results.

I hereby tender my thanks for the discovery of such a useful substitute and for the courtesy extended to me in an emergency.

To go into details, the vast majority of the moths were *Xylophasia monoglypha* and among them one nearly as black as any from Scotland. *Miana bicoloria* and *Apamea secalis* were nearly as common, and next to these came *Hydroecia nictitans* in lovely condition and great variety. Among them I picked out four *H. paludis*, a species which I always imagined should occur at Deal, but had never previously taken.

The Agrotids—the great army of the Deal sandhills—were not yet out in full numbers, but a lovely lot of *A. valligera*, *A. nigricans*, and *A. tritici* were taken—the most beautiful French-grey form of the latter I have ever seen being secured by my boy—almost the colour of *A. ashworthii*. *Agrotis puta* was just beginning, and *Caradrina taraxaci*, *Cerigo cytherea*, *Mania tragopogonis*, *Triphaena comes*, *Leucania pallens*, and *L. impura* were in considerable numbers. A single *Chariclea umbra* occurred (rather early for this species) and *Manestra subjecta* was a new-comer to me for this locality. Although the foregoing species made up the great bulk of the numbers there were a good many others represented—*Leucania conigera*, *L. lithargyria*, *L. straminea*, *Xylophasia sublustris*, *X. lithoxylea*, *Miana literosa*, *Hecatera serena*, and *Triphaena ianthina* (the last two rare visitors to treacle). *Luperina testacea* was out and sat on the grass and posts, apparently without actually feeding, while a single *Gonoptera libatrix* on August 3rd, touched record date for a hibernated specimen, overlapping freshly emerged captures of other years by nearly a month.

Here again day-work was very poor. We visited the sandhills where we took a fine *Erémobia ochroleuca*, saw some worn *Mesotype virgata* and *Zygaena filipendulae* and one *Argynnis aglaia*; also the Kingsdown Cliffs, St. Margaret's Bay, and the Folkestone Warren, but hardly made a capture. *Melanargia galathea* was still fairly fresh, *Aspilates gilvaria* well out and *Eubolia bipunctata* common, but remarkably little else beyond the very commonest things. *Callimorpha dominula* was over at its Kingsdown locality and we only saw a dead one on a nettle leaf.

We had another string to our bow however for day-work, and that was *Nonagria sparganii*. In a special locality we took enough pupae for long series and they are already coming out well. As a matter of fact two came out on the last day we took them—August 5th, although several were still in a larval state. This must have been about the first emergence as we found no empty pupae. *N. typhae* was common at the same place and from water-bedstraw a nice lot of *Chaerocampa (Eumorpha) elpenor* larvae were picked up—some already full-fed. A considerable proportion of the *typhae* were ichneumonid, but apparently no *N. sparganii*. I could not at first make out these ichneumonid pupae. They were so small and yet perfect that I thought I must have run across a colony of *N. geminipuncta* feeding

on bullrush. They were exactly this size. At last, however, I broke one and found the ichneumon inside almost ready for emergence.

I took a few *N. typhae* from *Typha latifolia*, but mostly from *Typha rotundifolia*. All the *N. sparganii* were from the latter plant, sometimes from a stem so small that it looked impossible for it to contain a pupa. *N. sparganii* of course pupates head upwards like *N. cannae*, and so near the emergence hole that the pupa—which has a well pronounced beak—can usually be seen as soon as the disc is broken. *N. typhae*, on the other hand—head downwards—is often six or eight inches above this aperture. The bulk of *N. sparganii* were taken in small stunted plants growing on dry land or similar plants at the edge of a large bed, but large healthy plants in the water seldom produced specimens. Such plants however were frequently tenanted by *N. typhae*.

Almost in the town of Deal, *Earias clorana* larvae were in immense numbers, almost every osier shoot containing one or more larvae in the twisted bunch of leaves at its head. They were nearly full fed, and spun up almost at once.

On our way back we looked in—after many years absence—at Chattenden Woods. I am afraid it is almost a thing of the past as a collecting ground. One side is cut up into building lots and the *Scoria dealbata* ("Deal-beaters" as the old keeper there used to call them) ground, which was such a Paradise thirty years ago, is no more. It is a mass of rank trees and over-grown bushes; all the undergrowth and grass gone, and with it all the insect wealth,—*S. dealbata*, *Toxocampa pastinum*, *Melanargia galathea*, *Nola albulalis*, *Diacrisia sannio* (*russula*), *Chattendenia w-album* and many others. I left the wood quite saddened by these recollections of the past glories gone, alas! for ever! Nearer home other past memories were revived on seeing the old site of Dartford Heath and its famous fence covered with rows of workman's cottages. Darenth Wood, of which the top was visible in the distance, apparently remains, but on the main road London now extends without intermission right into Gravesend.

Still, when we arrived home and reviewed our captures, and planted out our larvae, I reflected that there is still much good collecting to be done by the Londoner, not far beyond the confines of the Home Counties.

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### Good Localities.—Le Rozier (Lozère).

By MONSIEUR L. LHOMME.

Published in *L'Amateur de Papillons* Librairie des Sciences Naturelles. 3, Rue Corneille, Paris. Volume 1, Nos. 2 and 3.

Cévennes. Altitude 400 metres.

Ordnance Map to the 1/80000. No. 208.

Severac, S.E. Post-Office: Peyreleau (Aveyron).

Railway Station.—Millau. Communications by mail-carriage from Millau to Le Rozier.

Le Rozier! This name alone brings to my mind repeated feelings

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[Translation, with the Author's permission, by Lt. E. B. Ashby, F.E.S., member Soc. Ent. de France].

of happiness ; happiness because, for the first time since the beginning of the war, in July, 1918, we were able to leave the sad and dismal Paris, roused up too often by the sirens ; happiness because each day was bringing us the echo of the triumphal march of the Allied troops, leading the Boche at last back to his den ; happiness to live without anxiety for the morrow, to rest freely in a glorious country ; happiness lastly from being able to devote one's whole days and a portion of one's nights, without constraint and in complete security, to the chase and study of the numerous species of butterflies and moths, found in this rich entomological locality.

Le Rozier is a modern village, built on the river Jonte at its confluence with the river Tarn, at the commencement also of those magnificent gorges so celebrated and so much visited. Opposite, on the other bank, arises Peyreleau, an ancient small market town, whose old fashioned houses, seeming to come out of the rock, lie low around a feudal chateau partly overgrown by ivy. The whole is commanded to the north by the Causse Méjean, to the south by the Causse Noir whose cliffs of nearly 400 metres in height seem to overwhelm this charming landscape.

All life is concentrated in the valley ; it is there that the river rolls unceasingly its foaming waters, which disappearing here and there into unknown subterranean whirlpools, reappear further on to continue their wandering course from rock to rock ; it is there that the roads are furrowed and trodden by carriages, animals, and people ; it is there that the villages fill the air with the noises of the countryside, and with their wonted smoke ; and lastly it is there that the greater part of the butterflies and moths, which we have come to study flutter about. Whilst high up there, on the Méjean, there is aridity, solitude, death for kilometres and kilometres in extent. Entire villages have been deserted. Capluc shows to the saddened eyes of excursionists its gaping homes, partly fallen in, without doors, without windows ; its sheds without cattle ; its little streets silent, devoid of inhabitants. Neither butterflies nor people live in these solitudes, and if the lepidopterist has little time to dispose of, it would be a waste of time to climb and collect there\*.

The Causse Noir which stands opposite is less devastated : its numerous little woods of stunted, thickly planted pines, shelter in spite of all, a varied flora, and consequently a certain number of butterflies fly there.

Although the valley is a hundred times richer, the lepidopterist will do well to visit these regions ; he will find there certain species which do not descend lower. If, one day, he is able to follow his collecting up to the declivity of the Causse Noir jutting towards La Roque, he will see there this strange mixture of thousands of dolomite rocks, split asunder by weather and rain, standing up like the ruins of an immense town ; without difficulty, he will find there streets, squares, porticos, colonnades, trunks of statues of a town of Giants, demolished by Giants.

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[The Causses are, as their name indicates (Latin "Calx"), plateaux of Jurassic limestone. See also Baedeker's *Southern France*.—E.B.A.]

\* [For an interesting account of this whole district see Baring-Gould's, *The Deserts of Southern France*, now a rare book to obtain.—H.J.T.]

Montpellier-de-Vieux is very interesting to visit during the day in bright sunlight, but the night, by moonlight, or in its absence by the light of the collecting lamp, it becomes impressive, and I know many people who giving way to their imagination, would prefer to collect alone in the night in the open forest, rather than amidst this assemblage of dolomite blocks. If, by this short description, I have succeeded in making the country attractive, and if you wish to go and collect there, come along. Before setting out for Millau, let us book our rooms at the Hotel Rascalou, at Le Rozier, and let us write to Monsieur Rey, at Meyrueis, in order to reserve places in the carriage. Let us arrange to arrive at Millau before midday, and after having found, near the square, the coach-house of our diligence, where we book our luggage, we go and have déjeuner. We leave Millau about 2 o'clock, and as we shall not arrive at Le Rozier until 5 p.m., we have time to admire the landscape which by degrees becomes picturesque. When we have passed Rivière, where the conveyance stops a few minutes for postal duties, we notice on our left the imposing remains of a feudal castle. It is Peyrelade, which I mention in passing, because you will see, below these ruins a considerable plantation of evergreen-oak (*Quercus ilex*), the Holm or Holly oak, and if we are in this part towards July 24th, we can come and collect *Lycæna dolus*, the larva of which is still unknown\*; it would therefore be very interesting to search for it and to study it. We can take, at this period, with *L. dolus*, *Lampides baeticus*, *Zygaena occitanica*, *Z. hilaris*, and some other good species.

We follow the river Tarn, the valley contracts and the great Causses appear before us. To the right the Causse Noir, to the left the Sauveterre, and further, beyond the confluence of the Tarn, the Méjean. These immense wastes belong to the Bajocien stratum, surmounted with Bathonien, compact calcareous rocks, very often dolomitic. We shall therefore have around Le Rozier only calcareous ground to visit; in order to find silica, it would be necessary to cross over the River Jonte as far as Meyrueis, where the siliceous mass of the Aigoual commences. About 5 p.m. we alight at Le Rozier, whilst our driver, changing horses, continues his journey as far as Meyrueis.

If we arrive here at the beginning of July, we shall be able the following day, to go and catch the variety *lozereae* (Oberthür) of *Parnassius apollo*, the king of the mountain. Honour to whom honour is due!

With this intent we leave the hotel about 8 a.m. From the threshold, looking up, we notice on the Causse a cross commanding Peyreleau; it is on the plateau between this cross and the farm of Aleyrac that we seek for this *Parnassius*. We traverse the Jonte, then Peyreleau; we follow the La Roque road, which climbs over the Causse by means of numerous zigzags; with a little care we shall certainly find some short-cuts and in less than an hour, we shall be at the summit (No. 1 of the map). We encounter fresh and rather keen air; we see, a little way on, this magnificent species flutter from flower to flower, we must therefore follow it and capture it at all costs. This hunt on a fresh and bright July morning, this course of hygiene in an

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\* [According to Seitz it feeds on *Medicago* and *Onobrychis*, and we have read is attended by ants.—H.J.T.]

atmosphere so pure, stimulated by the joy of making every now and then some fine captures, since in less than three hours we have been able to take 30 specimens, has left in me an unforgettable remembrance. If, after your hunt, you wish to refresh yourself, do not forget that you will find at the farm of Aleyrac, for certain a warm welcome and a well furnished table. To return to Le Rozier, we follow the zigzags of the road; it is now 11 o'clock, and numerous butterflies are fluttering about.

We have only to make our choice. Notice in passing the end of the longest zigzag; (point 2 of my map) you will see there at about 100 metres from the bend above a path rising amidst the pine woods, a spot, which I recommend to you, for moth-hunting at night. I have taken there many night flying moths, macros and micros. Another spot which you would like to know (No. 3 of my map) is found at about 200 metres from the first houses of Peyreleau; after having left the last zigzag, you will see there, on the left of the road, some fields with a gentle slope, often planted with lucern, where you can without fatigue, hardly a kilometre from the hotel, also make some good and varied bags, at different hours of the day.

After déjeuner, we set our captures of the morning, and prepare our collecting apparatus for to-night. We afterwards call on the principal of the school at Peyreleau. Monsieur Carrière knows the country very well. He has written some very interesting articles on the district which he inhabits; he can give us useful information.

We shall ask him kindly to introduce us to the Head of the Police, and to explain to him that we have come here in order to study the insects of the district, and that we are going to use acetylene lamps in order to catch moths. This precaution is necessary, especially if we collect around the River Tarn or the River Jonte, where trout abound, so as not to be taken for poachers.

About 8 p.m., after having asked the proprietress of the hotel for the house key, we set forth taking the road to Meyrueis, which we follow for about 2 kilometres. In going through Le Rozier, we naturally perplex the good people of the place; you hear some women sneer and timidly say: "Butterflies, Butterflies." Let them talk, for you will agree that it is not very wicked, and that it makes them quite happy. When we have reached the second kilometre road mark, we shall find, 50 metres further, a bend in the road: it is at this spot, beside a ravine, that I did my first collecting at night (No. 4), always very successful, up to the time when, attacked literally by some thousands of little flies, I was obliged to give up and, after some unhappy attempts, to betake myself to half way up the height of the Causse Noir where the mosquitos did not come, but where the moths turned up at the lamp in great numbers.

The road which we have just traversed to-night is also very productive by day. You can ascend it further in the direction of Meyrueis, whilst working the fallen (waste) ground where *Lavandula vera* and *L. latifolia*, *Rhus coriaria* and *R. cotinus*, *Doryenium suffruticosum*, *Aphyllantes monspeliensis*, and *Cephalaria leucantha* grow; that high white scabious at the foot of which you sometimes find, in a loose web some small *Melitaea* caterpillars. We shall capture there *Laeosotis roboris* on the flowers of *Origanum vulgare* about July 15th (No. 4), at the same spot where we collected at night. *Papilio podalirius* is very abundant on this road; I remember having seen, one day, about midday, when

returning from collecting, a dozen very fresh "Flambés"\* feeding, in the open village, on scraps from the kitchen which a housewife had just thrown in the front of her doorway. In order to capture *Coenonympha iphis* you must ascend the Causse Noir, to the west of Payreleau (No. 7). Monsieur Carrière, who accompanied us there to-day, July 15th, took a beautiful female of *Eurvanthis plumistaria*, which proves that that spring species has two broods at Le Rozier.

In order to capture numerous Zygaenids, we proceed about 4 p.m., at the time of their activity, over the side of the Causse Noir (No. 8), where we shall find a path in the midst of Lavender, Marjoram, and Centaury. We shall capture many specimens there, and you will see side by side, on the same flowers, *Zygaena ephialtes* and its variety *peucedani*.

The road which goes along by the river Tarn towards La Malène, will give us on leaving Le Rozier (No. 5), numerous caterpillars of *Deilinia (Hyles) euphorbiae*. Opposite on the other bank (No. 6), there is a good locality for *Zygaena occitanica*. The moth flies there about July 25th; but previously, we can find there on grasses, the white egg-shaped cocoons of this species. All this gives but a very poor idea of the numerous excursions which we can make in this country; other good spots are to be found; other captures are to be made there at either earlier or later dates. In any case, we were able to collect in one month, from July 1st to 31st, 1918, 383 different species of macrolepidoptera, and 168 species of microlepidoptera, without mentioning varieties. This represents 571 species out of the 4,050 of the French Fauna. Before giving a list of the interesting species captured at Le Rozier, I must mention that Monsieur l'Abbé Soulie captured on June 1st, at Moline, near Ispagnac, at the entrance of the Gorges of the River Tarn, several single specimens of *Thais medesicaste*.

If in order to vary our collecting, we may wish to put up for some days at Meyrueis, the carriage which brought us here can take us there, and we shall stop at the Hotel Rey. Naturally, since we are leaving the calcareous strata, we shall go and collect on the siliceous mass of the Aigoual, on the side of Connergues on the hill No. 1079 in the French Ordnance Map.

We shall take *Coscinia striata* in numbers, and some single specimens of its magnificent variety *melanoptera*. From Meyrueis, a postal conveyance can take us to Florac, where we have only had to put up at the Hotel Donnadiou. We shall be able to collect on the Ramponench, a mountain to the East of Florac, where one can catch, at the beginning of July, besides *Parnassius apollo* var. *lozevae*, *Zygaena rhadamanthus*, *Z. hilaris*, *Acidalia filacearia*, and other good species.

We shall again find at Florac, a railway which will take us to Sainte-Cécile d'Audorge, a station on the P.L.M., on the line from Clermont-Ferrand to Nîmes. The excursion will thus be finished.

List of the interesting species captured by Monsieur L. Lhomme

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\* [The popular French name of *Papilio podalirius*, on account of the long marking which it bears on its wings; the Germans call it "Segelfalter"; the popular name in English being the "Scarce Swallow-Tail Butterfly."]

at Le Rozier in July, 1918, and in the course of an excursion made to Meyrueis and to Florac at the same period.

### I. MACROLEPIDOPTERA.

*Parnassius apollo* race *lozereae*, Obthr., *Pieris manni*, Mayer, *Gonepteryx cleopatra*, L., *Melitaea deione*, H.G., *M. parthenie*, Bkh., *Argynnis amathusia*, Esp., *A. daphne*, Schiff., *A. niobe* var. *eris*, Meig., *Erebia epiphron* var. *cassiope*, F., *E. stygne*, O., *E. aethiops*, Esp., *E. tyndarus*, Esp., *Satyrus alcyone*, Schiff., *S. arethusa*, Esp., *S. statilius*, Hufn., *S. actaea*, Esp., *S. cordula*, F., *Enodia dryas*, Scop., *Epinephele ida*, Esp., *E. pasiphaë*, Esp., *Coenonympha iphis*, Schiff., *C. dorus*, Esp., *Laeosopis roboris*, Esp., *Chrysophanus virgaureae*, L., *C. alciphron* var. *gordius*, Sulz., *Lycaena meleager*, Esp., *L. escheri*, Hb., *L. dolus*, Hb., *L. arion*, L., *Carcharodus lavaterae*, Esp., *Hesperia carthani*, Hb., *H. sao*, Hb., *Lophopteryx cuculla*, Esp., *Arctornis L-nigrum*, Mueller, *Lasiocampa quercus*, L., *Odonestis pruni*, L., *Dendrolimus pini*, L., *Acrionicta leporina*, L., *Agrotis agathina*, Dup., *A. margaritacea*, Vill., *A. obelisca*, Hb., *A. crassa*, Hb., *Mamestra treitschkei*, Bdv., *Dianthoecia tephroleuca*, Bdv., *Hadena hepatica*, Hb., *Polyphaenis sericata*, Esp., *Luceria virens*, L., *Leucania sicula*, Tr., *Caradrina selini*, Bdv., *Lithocampa millierei*, Stgr., *Thalpochares polygramma*, Dup., *Grammodes algira*, L., *Apopestes limbata*, Stgr., *Acidalia filacearia*, H.S. (Florac), *A. sericeata*, Hb., *A. moniliata*, Fb., *A. ostrinaria*, Hb., *A. calunetaria*, Stgr., *A. filicata*, Hb., *Lythria plumularia*, Fer., *Odezia atrata*, L., *Anaitis praeformata*, Hb., *Triphosa sabaudia*, Dup., *Lygris populata*, L., *Larentia permistaria*, H.S., *L. oxybiata*, Mill., *Tephroclystia breviculata*, Donz., *T. venosata*, F., *T. graphata*, Tr., *Hygrochloa syringaria*, L., *Synopsia sociaria*, Hb., *Boarmia ribeata*, Cl., *Tephronia sepiaria*, Hufn., *Gnophos glaucinaria*, Hb., *Eurranthis plumistaria*, Vill., *Bupalus piniarius*, L., *Nola albula*, Schiff., *Paidia murina*, Hb., *Lithosia pallifrons*, Zell., *Heterogynis penella*, Hb., *Zygaena sarpedon*, Hb., *Z. ephialtes* ab. *medusa*, Pall., *Z. ephialtes* race *athamanthae*, Esp., *Z. rhadamantus*, Esp., *Z. hilaris*, Och., *Z. occitanica*, Vill.

### II. MICROLEPIDOPTERA.

*Crambus furcatellus*, Zett., *Platytes alpinellus*, Hb., *Eromene bella*, Hb., *Ancylolomia tentaculella*, Hb., *Ephestia tephrinella*, Ld., *Megasis ilignella*, Z., *Alophia combustella*, H.S., *Amphithrix sublineatella*, Stgr., *Rhodophaea rosella*, Sc., *Herulia glaucinalis*, L., *Perinephila lancealis*, Schiff., *Metasia corsicalis*, Dup., *Pionea elutalis*, Schiff., *Pyrantia alpinalis*, Schiff., *Platyptilia farfarella*, Zell., *Alucita baliodactyla*, Zell., *Dichelia gnomana*, Cl., *Eulia formosana*, Hb., *Tortrix croceana*, Hb., *Cnephasia argentana*, Cl., *Euxanthis margaritana*, Hb., *Olethreutes branderiana*, L., *O. micana*, Hb., *Steganoptycha diniana*, Gn., *Pelatea festivana*, Hb., *Argyresthia goedartella*, L., *Cerostoma sylvella*, L., *Topeutis barbella*, F., *Psecadia aurituella*, Hb. *Hypercallia citrinalis*, Sc.

I earnestly ask our readers to give us many accounts of the above kind; they will do a service to their colleagues, since a lepidopterist, who has only a few days' holiday, often hesitates, or refuses to take a risk. He will return more willingly to the places which he knows,

where he has already collected, and consequently, he will again find the same species, if he goes there just about the same dates. Whereas, guided by the "Amateur des Papillons," he will set out without fear of false steps, of feeling his way, he will experience no difficulty in satisfying the inward pleasure of his life; he will be able to occupy himself solely in his dear studies, in a country new to him.

[I wish to thank my friend, Monsieur A. J. Mathieu, of Barclay's Bank, Ltd., (Foreign Branch), most cordially, for kindly reading through my translation. I would also point out that the various numbers quoted in the above article refer to points on the map, which may be consulted in Monsieur L. Lhomme's original articles, which are in the Library of the Entomological Society of London.

For those readers who wish to travel in this delightful district, I would recommend them to get either the Carte Routière du Ministère de l'Intérieur au 100,000

Carte 44 degrees by 18	} 3 maps.
Carte 15 degrees by 11	
Carte 44 degrees by 11	

or Carte de France à  $\frac{1}{200000}$ . Sheets 65 and 66. 2 maps.

Any of these are obtainable by ordering beforehand from either Edward Stanford, Ltd., 12, Long Acre, London, W.C., or from Hachette and Company, 18, King William Street, London, W.C.]

### The Nomenclature of the European *Euchlœ ausonia*, Hb. (= *belia*, auct. nec L.)

By Dr. ROGER VERITY,

I have pointed out in the *Ent. Rec.*, 1919, p. 143, that the two generations all authors talk of with such assurance are a myth; when they seem to exist, it is a case of "bipartite emergence." In Oberthür's *Ét. Léop. Comp.*, XVII., p. 48 (1920), G. Catherine confirms my views by a discussion of the facts observed by him at Dosches (Aube). I fully agree with Kirby (*Syn. Cat. Diurnal Lep.*, p. 506) and with Lord Rothschild (*Novitates Zool.*, XXI., p. 302) that the specific name should be *ausonia*, Hübner; that the latter's figures 582-3 ("type" from "Italy" in the coll. of Abate Mazzola of Vienna), should, however, represent a specimen of the high alpine race, as supposed by Butler and by those authors, I feel anything but certain. It must not be overlooked that it is a female and Hübner's own figure of female *marchandae* shows well how utterly it differs from it. I have never seen one like it from the Alps, whereas it is very similar indeed to some females of race *graeca*, Vrt., from the Balkans. A similar case extends into the N.E. of Italy (I possess it from the Piave); the female marked "male" by a misprint on plate, of *graeca* from the Crimea I have figured on pl. XLIX. of *Rhopal. Pal.*, fig. 16, is, for instance, a near approach to Hübner's on both surfaces; more specimens from the N.E. of Italy would probably settle this question. In the meantime, to my mind, one should on no account drop the name of *marchandae*, Hüb., = *simplonia*, Fr. for the race of the Western Alps, so well figured by the former, and one should note that *ausonia*, Hb., whether from high

altitudes or not, certainly belongs to the form of the early emergence, so that it is most astounding that Staudinger and others should have used it for the later one. Kirby very rightly divides the races of this species into two varieties: one from the "S.W. of Europe and Africa" and the other from the "South of Europe and Asia Minor." In *Rhop. Pal.* I grouped the minor races, which have since been described, in the same way. These groups meet just on the boundary of the Peninsular Italic subzone: on the northern watershed of the Apennines, in Emilia, one meets with the first, and on the southern watershed, in Tuscany, it abruptly changes to the second; the former, however, already shows in the early emergence signs of transition to the latter on the underside of the hindwings, by its very broad silvery-white spaces and by the strong mixture of yellow (see specimens from Modena in *Rhop. Pal.*, pl. XXXVI, fig. 31 and 32). This same form prevails also at Genoa, according to Rocci, who has named it *genuensis* (*Atti Soc. Ligustica Sc. Nat.*, 1920, N. 4, p. 5); thence, along Liguria, it gradually turns into *romana*, Calb., towards the east and into the entirely western form towards the west. Rocci has named the corresponding transitional form of the late emergence of Genoa, *maritima*. At S. Remo and Bordighera this species has already fully acquired the western features, and Turati has named *matutia* (*Nat. Sic.*, 1905, p. 28, pl. II., f. 7-12), the early emergence individual form, found frequently there, which exhibits those features to their highest degree. Turati was rather surprised when Rothschild made a local race of *matutia* and named the late emergence *turatii*, giving because it is unknown, however, no description of it, nor quoting, so that it remains a *nomen nudum*. To my knowledge from western Liguria and Piedmont, all through France and Spain, one meets more or less with the same race; its individual variations are certainly striking, but they seem to occur all over this vast area; *matutia*, for instance, is nothing but Ribbe's *alhambra* from "Granada, collected in April and May," and both these names apply to the individuals with very pointed wings and very dark undersides, found everywhere (see specimens from Digne and Bordeaux, figured in *Rhop. Pal.*, pl. XXXVI, together with "co-types" sent to me by their authors). It has thus been a slip of Rothschild to apply the name of *alhambra* to the late emergence of Southern Spain. Concerning the name which should be used for the widespread race of the west, mentioned above, one meets again with confusion. Rothschild states that Butler, in 1869, gave the name of *crameri* to a specimen of the early emergence form of this race, so this seems to be the oldest and the one to be used. Otherwise the next would be *esperii*, given by Kirby to Esper's figure 1 of pl. 94, and applied by Rothschild to the late emergence of the French race. Here, too, I must remark, I am unable to follow him, because Esper's figure represents most clearly a male of the early emergence; thus Rothschild's *nomen nudum* of *kirbyi*, proposed for the latter, falls before *crameri* and *esperii*, together with my name of *occidentalis*. The surprising result of all this, if I am not mistaken, is that the late emergence form of the west, usually known as *ausonia*, has to this day received no name except the *nomen nudum* of *turatii*, Roth. I think the rules on

nomenclature do not allow one to utilise a name in this condition\*, so that I propose the new one of *ROTHSCHILDI*, mihi, taking as "types" the male of fig. 48 and the female of fig. 46, on Pl. XXXVI. of *Rhop. Pal.*, collected by C. Ribbe in the mountains of Granada, and sent to me with *alhambra*; they are quite similar to some French and Piedmontese specimens, whilst others from Granada differ considerably from the two figured, individual variation being broad everywhere. It is worthy of notice that wherever this species has been found at high altitudes (from 1,000m. upwards) in Peninsular Italy, it always belongs to the late emergence form.

I should, thus, summarise the races of *Euchloë ausonia*, Hb., from Europe, in the following way:—

Race *crameri*, Butler: I. emergence *crameri*, Butler=*esperii*, Kirby=*occidentalis*, Vrty.; II. emergence *rothschildi*, Vrty.—Spain, France, Piedmont and extreme W. of Liguria. (Forms *matutia*, Turati, and *alhambra*, Ribbe, are individual forms of *crameri*. The names of *kirbyi*, Roth., and *turatii*, Roth., are *nomina nuda*).

Race *genuensis*, Rocci; I. emergence *genuensis*, Rocci; II. emergence *maritima*, Rocci.—Central Liguria and Emilia.

Race *romana*, Calberla; I. emergence *romana*, Calb.; II. emergence *romanoides*, Vrty.—Peninsular subzone of Italy.

Race *kruegeri*, Turati; I. emergence *kruegeri*, Turati; II. emergence *trinacriæ*, Turati.—Sicily and southern Calabria.

Race *ausonia*, Hüb.; I. emergence *ausonia* Hüb.; II. emergence unknown.—Presumably the N.E. of Italy.

Race *graeca* (Stgdr. in litt.) Vrty.; I. emergence *graeca*, Vrty.; II. emergence *maxima*, Vrty.—Balkan zone and the Crimea.

Race *uralensis*, Bartel; I. emergence unknown; II. emergence *uralensis*, Bartel.—Ural Mts.

Race *marchandæ*, Hüb.=*simplonia*, Fr.—High altitudes in Western Alps and, according to Rothschild, in Eastern Pyrenées.

Race *oberthüri*, Vrty.—Western Pyrenees.

Race *flavidior*, Wheeler, described in his *Butt. of Switz.*, p. 63, from the Rhone Valley, in the plain, I am not acquainted with, but its description sounds like an interesting race, intermediate between *marchandæ* and *romana* or *graeca*.

## NOTES ON COLLECTING, etc.

WARWICKSHIRE RECORDS OF ICHNEUMONIDÆ (concluded).—This final list of records up to date includes the more interesting forms met with since 1921.—*ICHNEUMONINÆ*.—*Stenichneumon trilineatus*, Gm.—Stoke, 8.viii.23. *Cratichneumon fugitivus*, Gr.—Kenilworth, 3.vi.22, ♂. *C. albilarvatus*, Gr.—Cathirons, 27.v.22, ♂, F. Pepper; Kenilworth, 3.v.23, ♂. *C. lanius*, Gr.—Coombe, 3.vi.22, ♂♂. *Melanichneumon saturatorius*, L.—Wolvey, 3.vii.21, ♂. *Barichneumon ridibundus*, Gr.—Stoke, 9.viii.22, ♂. *B. vestigator*, Wesm.—Stoke,

\*Yes you can adopt a logonym and validate it—I have done it with Staudinger's Sale Lists.—J.H.D.

4.ix.22, ♂. *Ichneumon deliratorius*, L.—Coombe, 10.vi.23, ♂. *I. sarcitorius*, L.—Stoke, 20.vi.22, ♂; 10.viii.22, ♂; Binley, 2.x.22, ♀. *I. suspiciosus*, Wesm.—Stoke, 1.viii.22, ♀; Stretton, 24.xii.22, ♀, F. Pepper. *I. gracilentus*, Wesm.—Coombe, 6.viii.23, ♂. *I. raptorius*, Gr.—Stoke, 3.viii.22, ♂; Coombe, 6.viii.23, ♀. *Chasmodon notatorius*, Fab.—Binley, 8.ix.23, ♂. *Ctenichneumon castigator*, Fab.—Ryton, 9.ix.23. *Amblyteles armatorius*, Fst.—Stoke, 17.vi.23, ♀♀; (host *T. pronuba*). *Probolus alticola*, Gr.—Brandon, 23.vi.23, ♀, F. Pepper. *Platylabus pedatorius*, Fab.—Binley, 2.x.22, ♂. *P. phaleratus*, Hal.—Coombe, 23.ix.23, ♀. *Phaeogenes stimulator*, Gr.—Coombe, 3.vi.22, ♀. *Aethecerus placidus*, Wesm.—Coleshill, 29.v.22, ♂. *Hemichneumon elongatus*, Rtz.—Willenhall, 20.v.22, ♂♂, ♀; (host *Psyche* sp.?).

CRYPTINÆ.—*Plectocryptus digitatus*, Gm.—Coombe, 3.vi.22, ♂; Brandon, 11.vi.22, ♂. *Cubocephalus oriventris*, Gr.—Brandon, 24.ix.22, ♂. *Microcryptus abominator*, Gr.—Napton, 6.viii.22, ♂. *Glyphicnemis suffolciensis*, Morl.—Stoke, 30.vi.23, ♀. *Phygadenon leucostigmus*, Gr.—Brandon, 24.ix.22, ♀; Binley, 2.x.22, ♀. *P. fumator*, Gr.—Stoke, 13.viii.22, ♀; Binley, 8.ix.23, ♀♀. *Hemiteles necator*, Gr.—Stoke, 20.vi.22, ♀♀. *H. bicolorinus*, Gr.—Stoke, 1.vi.22, ♀. *H. tristator*, Grav.—Stoke, 4.ix.22. *H. ridibundus*, Gr.—Stoke, 20.vi.22, ♀. *Stilpnus gagates*, Gr.—Stoke, 20.v.22, ♂; 1.vi.22, ♂; 20.vi.22, ♂. *Cryptus spiralis*, Fre.—Coventry, 6.ix.23, ♀, rare. *Cryptus tarsolencus*, Schr.—Bubbenhall, 4.v.22, F. Pepper; Southam, 6.viii.22, ♂; Frankton, 4.vi.22, ♂; Stretton, 6.vi.22, ♀, F. Pepper. *C. obscurus*, Gr.—Coombe, 3.iv.22, ♂; Stoke, 2.vi.23, ♀. *Habrocryptus porrectorius*, Fab.—Brandon, 27.v.22, ♀, F. Pepper. *H. brachyurus*, Gr.—Ufton, 6.v.23, ♀.

PIMPLINÆ.—*Rhyssa persuasoria*, L.—Princethorpe, 1922, ♀, Dr. Newton; Coventry, 25.viii.23, ♀. *Ephialtes carbonarius*, Chr.—Bubbenhall, 17.ix.22, ♀♀, F. Pepper. *Perithous mediator*, Fab.—Brandon, 22.ix.22, ♀. *Pimpla graminellae*, Hlgr.—Bubbenhall, 11.vi.23, ♀, F. Pepper. *P. brevicornis*, Gr.—Bubbenhall, 27.viii.22, ♀, E. H. Sills. *P. punctiventris*, Thms.—Binley, 23.ix.23, ♀. *P. nucum*, Rtz.—Stoke, 5.xii.22, ♀♀♀♀; (host *Pontania pedunculi*, Htg.). *P. alternans*, Gr.—Napton, 6.viii.22, ♀. *P. brassicariae*, Poda.—Coleshill, 26.v.23, ♀. *Glypta flavolineata*, Grav.—Coleshill, 29.vi.22, ♀♀. *Phytodiaetus coryphaeus*, Gr.—Stoke, 28.v.22, ♀. *Lampronota melancholica*, Gr.—Coombe, 3.vi.22, ♂.

TRYPHONINÆ.—*Polyclistus mansuetor*, Gr.—Stoke, 13.vii.20; 20.ix.22. *Evochus prosopius*, Gr.—Napton, 6.viii.22. *Homocidus cinctus*, Grav.—Coombe, 25.vii.22. *H. tarsatorius*, Pz.—Brandon, 24.ix.22. *H. ornatus*, Gr.—Stoke, 29.xi.21; 14.v.22; Coventry, 12.x.22. *H. crassicornis*, Thms.—Brandon, 27.viii.22. *Promethus laticarpus*, Thms.—Stoke, 28.v.22. *Sphecochaga vesparum*, Curt.—Ryton, 6.vi.22; Stoke, 20.vi.22. *Mesoleius semicaligatus*, Gr.—Binley, 2.x.22; Stoke, 4.ix.22. *M. segmentator*, Hlgr.—Stoke, 25.v.23; Stretton, 18.v.23; 17.vi.23; (host *N. latipes*). *Dyspetes praerogator*, L.—Stoke, 9.ix.22; 29.ix.23. *Tryphon signator*, Gr.—Coombe, 3.vi.22. *Exyston brevipetiolatum*, Th.—Coombe, 3.vi.22. *Mesoleptus typhae*, Fre.—Coleshill, 20.v.23, ♀. *Euryproctus notatus*, Gr.—Packington, 4.vi.21. *Perilissus filicornis*, Gr.—Ryton, 4.vi.22; Brandon, 11.vi.22; Stoneleigh, 14.vii.23. *Lathrolestus unguularis*, Thms.—Stoke, 1.xii.22.

OPHIONINÆ.—*Proclitis praetor*, Hal.—Stoke, 3.ix.23; (host

*Emphytus pallipes*. *Perizon angustipennis*, Hlgr.—Brandon, 24.ix.22. *Campoplex foveolatus*, Frst.—Coleshill, 26.v.23; Kenilworth, 3.vi.23, F. Pepper. *C. costulatus*, Bdg.—Stoke, 2.vi.23. *Nemeritis cremastoides*, Hlgr.—Stoke, 1.vi.22. *N. rufipes*, Bdg.—Stoke, 12.vii.22; 20.ix.22; 2.vi.23. *N. gracilis*, Gr.—Stoke, 3.viii.22. *Phobocampa obscurella*, Hlgr.—Coombe, 15.vii.22. *Omorga faunus*, Hlgr.—Stoke, 18.vi.22. *O. ramidula*, Brsh.—Stoke, 10.vi.21. *O. multicincta*, Gr.—Stoke, 5.vi.21; Coleshill, 29.vi.22. *Olesicampa longipes*, Müll.—Bubbenhall, 23.viii.23; (host *Pristiphora viridana*). *Pectenella latiungula*, Th.—Stoke, 4.ix.22. *Angitia majalis*, Gr.—Stoke, 10.ix.21; 2.ix.22. *A. fenestralis*, Hlgr.—Stoke, 30.vi.22; 20.ix.22; (host *Pontania pedunculi*, Htg.). *Anilasta inquinata*, Hlgr.—Coombe, 15.vii.22. *Labrorychus nigricornis*, Wesm.—Stoke, 22.v.23; Coombe, 21.vii.23. *Agrypion variatarum*, Gr.—Coleshill, 26.v.23. *Cphion luteus*, Linn.—Coventry, 17.viii.23, 7.ix.23, 11.ix.23. 14.ix.23; Bubbenhall, 9.vii.23, F. Pepper. *O. distans*, Th.—Coventry, 1922, F. Pepper. *O. scutellaris*, Th.—Ryton, 6.vi.22; Coventry, 18.viii.23, 20.viii.13. *O. ventricosus*, Gr.—Bubbenhall, 23.v.22, F. Pepper. *O. parvulus*, Kr.—Kenilworth, 3.vi.23. *Paniscus cristatus*, Th.—Coventry 27.iv.23, Dr. Newton; Kenilworth, 3.vi.23. *P. melanurus*, Th.—Frankton, 17.vi.23. *P. gracilipes*, Th.—Coventry, 11.iv.23; Stoke, 29.ix.23.—J. W. SAUNT, 53, Enfield Road, Stoke, Coventry.

## CURRENT NOTES AND SHORT NOTICES.

The annual volume from Portici *Boll. Lab. zool. gen. e Agr.*, vol. xvi. (1922) contains memoirs by several well-known workers: T. Silvestri, Insects of the hazel; E. Ragusa, The *Aegeriidae* (*Sesiidae*) of Sicily; G. Grandi, studies of various races of *Bombyx mori*, etc. Prof. Silvestri deals with the *Tortricidae*, *Gyponoma* (*Semasia*) *neglectana*, and its parasites (Hym) *Formica cinerea*, *Apanteles victorius*, *Meteorus cincellus*, *Macrocentrus nitidus*, *Pimpla nucum*, *P. alternans* (Dip.), *Phytomyzeta nitidiventris*; *Epiblema penkleriana*, with (Hym.) *Eubadizon extensor*, and *P. nucum*; *Tmetocera ocellana*, with (Hym.) *Chalcis intermedia*, *Microdus dimidiator*, *Meteorus parvulus*, *Habrobracon genuensis*, *P. nucum*, *P. alternans* and *Parasieverola gallicola*; and the Tineid, *Recurvaria nanella*, with (Hym.) *Microdus rugulosus* and *Copidosoma nanella*; there are 50 illustrations mostly with numerous figures: the whole worked out very thoroughly.

The *Report of the Ent. Soc. of Ontario* for 1922 contains several special papers on the "European Corn Borer" (*Pyrausta nubilalis*) which in 1921 was reported as very destructive and an increasing menace to the crops. The pest was reported as not so prevalent as in that year owing probably to the summer being less dry and the heat less excessive, factors which when present much increase the incidence of the trouble. Various experiments were carried on for long periods in ploughing in the larvae and setting "recovery" traps with more or less unsatisfactory results, as the larvae seem to be able to withstand the vigors of an Ontario winter with considerable success. But how and where they secrete themselves is as yet an unsolved problem. It was thought in 1921 that the Tachinid, *Exorista nigripalpis* was likely to become an efficient check, but it was practically absent in 1922. There is an interesting account of Provancher, the Canadian Linneus.

The Grape-Leaf Hopper, the feather mite, the rose chafer, the seed-potatoe maggot are dealt with in special memoirs, and Messrs. Criddle and Curran are responsible for the yearly Entomological Record.

The *Ann. Rep. and Proc. of the Lancashire and Cheshire Entomological Society* are to hand and are for the years 1921-22. It is a record of good local work done by a society of earnest enthusiasts. The monthly meetings appear to be always interesting with plenty of exhibits and occasional papers, and opportunities are afforded to the young by the offer of prizes for field work and observation. Papers by well-known entomologists are obtained, as well as local papers and papers of a literary bearing. The President's Address in 1922 was "Moths and Myths," by J. W. Griffin, "Notes from a Cheshire Garden," by Rev. F. M. B. Carr, "Parasitic Wasps and Bees," by H. M. Hallett, and "A Preliminary List of the *Aphididae* of N. Wales," by Messrs. Theobald and Walton, are printed in extenso, with a further addition to the Faunal List of Lancashire and Cheshire. We were reminded by the excellent portait of the Hon. Recording Secretary, Wm. Mansbridge, of pleasant wanderings twenty years ago or more when he was a denizen of the South.

## SOCIETIES.

### THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

July 12th.—Mr. Main, the living *Emus hirtus* ♀ (Col.) exhibited in July, 1922, with ova and young grubs produced in captivity, also young larvae hatched from ova of the *H. pennella* exhibited at the last meeting; they fed readily on laburnum.

Mr. Hodgson, varied series of females of *Agriades thetis* and *Polyommatus icarus* from the Cotswolds.

Mr. Littlewood, specimens of *Macrothylacia rubi*, bred by forcing in November and December without cold influence intervening.

Mr. Grosvenor reported only form *hippocrepididis* of *Zygæna filipendulæ* from a locality which had hitherto produced only the typical form.

Mr. Turner, living bred imagines of *Oidaematophorus lithodactylus* from Lyme Regis, much more variegated than most continental forms; stems of Viburnum showing the exit cap and projecting chrysalis of *Aegeria andraeniformis*; and a very long series of *Polyommatus dolus* from Central and South France, Central Italy and Asia Minor, showing the racial variation, and communicated notes on the species.

July 26th.—Mr. F. S. Windsor, Oatlands Cottage, Horley, Surrey was elected a member.

The President exhibited a gynandromorph of *Polyommatus icarus* from Martigny, Switzerland; R. side ♂, L. side ♀.

Mr. Jacobs, a specimen of *Cemiostoma laburnella* and a Homopteron quite like it in facies, and occurring with it on Laburnum.

Mr. Withycombe, a young ♂ of *Chirocephalis diaphanus* bred from the egg.

Mr. Turner, living examples of the case-bearer, *Coleophora troglodytella*, bred from *Inula dysenterica*, Lyme Regis, Dorset.

Mr. Barnett, ab. *schmidtii* of *Rumicia phlaeas*, ab. *obsoleta* of *Aricia medon* and an extreme blue form of female of *Polyommatus icarus*, all from Surrey.

Mr. Edwards, a fine very fern-like dendrite on a flint from Salisbury Plain.

Mr. Step, the cast-skin of the Smooth Snake from Studland, Dorset.

Mr. Dennis, sub-species *amethystea* of the broom-rape, *Orobanchë minor*, grown in Chelsea Physic Garden on roots of Sea-holly, *Eryngium maritimum*.



## OBITUARY.

### The Hon. Nathaniel Charles Rothschild, M.A., F.L.S., F.Z.S. 1877-1923.

It was with much sorrow that we read in the daily press of the sudden death of the Hon. N. C. Rothschild at the early age of 46. More than a quarter of a century ago we remember that the late Mr. J. W. Tutt spoke of Mr. Rothschild as one of the coming young men in entomology, one who was not only able to help forward the study by his ready aid, but had the natural ability and desire to do some of the work himself. Time proved that our late editor's opinion was a correct one, for although all branches of science attracted Mr. Rothschild his preference lay more particularly in entomology, and he chose a hitherto neglected and little understood group, where very specialised work was needed.

Nathaniel Charles Rothschild was born in May, 1877: the younger son of the late Lord Rothschild. From a Preparatory School he passed to the Public School at Harrow in 1891, where he remained until 1895. Thence he went to Trinity College, Cambridge, passing the Natural Science Tripos in 1898 and taking his M.A. degree in 1901. On leaving the University he entered the firm of Messrs. Rothschild and Sons, New Court, E.C. Here in spite of his ardent love for natural history, he must have worked assiduously, for on the death of his father in 1915 during the war, he was called upon to take over the various and intricate financial matters which Lord Rothschild had been engaged in for the nation. The work however proved so onerous to a severely conscientious man, that he had a serious nervous breakdown in the following year, and from this he never completely recovered. The mental strain he endured cannot be appreciated fully by us, but his untimely death is undoubtedly one of the aftermaths of the war.

From early boyhood he was particularly attracted by Entomology, collecting and learning the secrets of insect life and habits of all orders; in 1895 at the age of 18 in conjunction with Bonhote he published a local fauna volume on the Butterflies and Moths of Harrow. But it was not along the well-worn paths of the study of the more attractive orders of insects that his real entomological work was done. With a schoolboy's desire for the new he acquired, by a chance purchase, some microscopic slides of blood-sucking parasites. This small beginning was followed up until he possessed a fair collection of Ectoparasites, and the momentous discovery of the fact, just at that period, that diseases were transmitted by bloodsucking insects, gave the impetus to the thoroughly business practical man, for he saw that the systematic study of Ectoparasites would turn out to be of the utmost economic importance to the human race. Henceforth his spare-time work was to further in every possible manner the investigation of the life-history of insect Ectoparasites. He accumulated material from all, even the remotest, parts of the world, not only for his own study but for that of other specialists, and to numbers of scientific journals he contributed

articles and notes to arouse general interest in what his foresight told him was of world importance. He lost no opportunity, for we find that on his trips to Egypt and to the Sudan he discovered the rat flea, which subsequently was found to be the chief agent in the transmission of bubonic plague. That the minute differentiation of closely allied species may be taxonomic work of the utmost importance, is proved by the existence in India of several species of rat flea, very alike structurally and difficult to discriminate, but differing in their habits and distribution, and in their ability to transmit disease, and thus affording a sufficient reason why some districts in India are free from plague. In this work Mr. Rothschild had the skilled entomological knowledge and suggestion of his lifelong friend Dr. Karl Jordan.

Some years ago, the collection of Ectoparasites thus accumulated was given to the British Museum, although remaining in Mr. Rothschild's hands for the time being. That, however, was not all, for in order that the upkeep and continued utility of the collection might be assured, a sum of £10,000 was placed at the disposal of the Trustees, and we understand provision has been made for the publication of a descriptive and illustrated catalogue for the use of research workers in the tropics.

The intensive study of one small group of animals did not prevent Mr. Rothschild from the consideration of nature from a broad point of view, for he saw that the growing prevalence of such intensive studies as his own, in other groups, would in the future doubtless tend to cause the extinction of many rare and local species or forms in a restricted fauna, such as our British Isles afford, and at all times he not only advocated the protection of such, but he was one of the most ardent originators of the Society for the Promotion of Nature Reserves, and in time he made himself personally almost entirely responsible for its existence. We are told that his will provides for the endowment of this Society to the extent of £5,000.

Another of our newer organisations which owes its existence largely to the initiative of Mr. Rothschild, is the Imperial Bureau of Entomology, an institution supported now not only by the home government, but by all the self-governing dominions and colonies of the Empire and already the most world-useful disseminator of scientific economic knowledge.

In 1915-16 the Hon. N. C. Rothschild was President of the Entomological Society of London—probably the youngest President in its history—The Fellows no doubt recognised his great scientific attainments, his ability and his active desire to further the aims of the Society. At that time it was his earnest wish that the Society should give up their most incommodious rooms in Chandos Street, and he took many steps to obtain this object even himself offering a house for their abode. When the Society did finally decide to change their quarters, it was a great pleasure for him to help them to achieve this, by his skilled advice and by a very handsome donation to the Housing Fund, which was established to purchase the freehold of the house at 41, Queen's Gate, S.W. The well-being of the Society was ever before him and a legacy of £1,000 will be added to the funds of the Society.

His opportunities were great: his achievements were great: 'tis rarely that these two are commensurate. We mourn his loss to science and to his friends.—H.J.T.

**Subscriptions for Vol. XXXV. (10 shillings) should be sent to Mr. Herbert E. Page, "Bertrose," Gellatly Road, New Cross, S.E. 14 [This subscription includes all numbers published from January 15th to December 15th, 1923.]**

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*Desiderata*.—Foreign examples, local races, vars. and abs. from all parts of the world of any butterflies included in the British list. Setting immaterial; exact data indispensable. Liberal return made.—*W. G. Pether, "Thalma," 4, Willow Bridge Road, London, N. 1.*

*Duplicates*.—*Cinxia*, *Bellargus*, *Coridon*, *H. Comma*, *Lineola*, *Galathea*, *Moneta*, *Nupta*, and many others. *Desiderata*.—*Blandina*, *Irish Icarus*, *Carmelita*, *Cuculla*. *Gonostigma*, *Ashworthii*, *Templi*, *Australis*, *Undulata*, *Smaragdaria*, *Testacea*.—*W. Gifford Nash, Clavering House, Bedford.*

*Duplicates*.—*Cinerea* ♀, fine forms, grey, brown and blackish, *Maritima* and vars. *Immorata* and other East Sussex species.

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## Myrmecological Notes.—New Australian Formicidae.

By W. C. CRAWLEY, B.A., F.E.S.

*Aenictus* DEUQUETI, sp. nov.

♂. L. 2.7 mm.

Entirely castaneous, the gaster and femora paler than the rest.

Whole body including legs and antennae, with plentiful fairly long pilosity.

Mandibles with a long apical tooth, a very small one next to it, followed by 3 or 4 very minute denticles. Near the base is a small longitudinal groove. Frontal carinae very close together as in *turneri*, For., but absolutely merged into one just behind the antennal insertions. Carinae on cheeks small. The scapes fail to reach the occiput by more than their width at the widest part. They are narrow at the base, and swell to more than twice their width at the apex. All joints of funiculus longer than broad, 3-6 only slightly so. First and second subequal, 3-6 shorter and broader, subequal in length, 7 and 8 increasing in length and breadth, the apical about equal to the 3 preceding together.

Head as broad as long, slightly broader in front, sides feebly convex, occipital border concave.

Promesonotum forms a single convexity, a little flatter at the mesonotum. Mesoeipinotal emargination very slight. Eipinotum almost flat for its first  $\frac{2}{3}$ ds, then descends to meet the declivity, which is vertical, very short, and bordered by a feeble ridge. Seen from behind it is in the form of a triangle with the apex truncate.

Nodes of pedicel, seen from above, of equal width, the first slightly longer than the second. In profile they are of equal height, the first bearing beneath a flat lamella, of equal width at top and bottom, with the bottom obliquely truncate, the acute angle directed backwards. The second has a small tooth beneath in front.

Femora and tibiae very attenuate at the base and swollen beyond the middle.

Smooth and shining. Sides of mesonotum, mesosternum, eipinotum, metasternum and nodes densely reticulate and submat; this reticulation extends partially on to the upper surface of eipinotum and first node.

Lismore, N.S.W. (C. Deuquet, 449 and 450). Type W.C.C. Coll.

Near *turneri*, For., from Queensland, but differs in being slightly larger and more robust, darker in colour, and particularly in the shape of the frontal carinae, and the scapes, which are shorter and thicker. Both nodes are longer than in *turneri*. This species is only the third of the sub-family *Dorylinae* yet discovered in Australia.

*Strumigenys* QUINQUEDENTATA, sp. nov.

♂ L. 2.4 mm.

Dark castaneous; mandibles, pedicel, antennae, legs and apical segments of gaster paler.

A few long hairs on clypeus, pedicel and gaster. Rest of body covered with short recurved hairs, including the scape and legs.

Mandibles nearly straight, half as long as the head, terminated by 4 teeth, the innermost longest, the apical slightly shorter, with 2 small teeth branching from it. About  $\frac{1}{4}$  of the length of the mandible on the inner border is a fifth tooth, as long as the apical, broad at base, pointed, slightly curved backwards.

Head shaped very similarly to that of *godeffroyi*; at its widest part, just before the occiput, it is  $\frac{3}{4}$  as wide as the head is long (without the mandibles). Anterior border of clypeus feebly convex, almost straight. The scape reaches beyond the posterior quarter of the head. Eyes at bottom of scrobe, a little behind the middle of sides. Joints 2 and 3 of funiculus slightly longer than broad, 3 longer than 2, and both together about as long as the first joint. Joint 4 less than  $\frac{1}{2}$  as long as the apical.

Pronotum rather narrow in front and rounded. Mesonotum slightly narrower behind than in front.

There is a distinct but feeble emargination at the meso-eipinotal suture.

Base of eipinotum slightly longer than the declivity, bordered and flat;

DECEMBER 15TH, 1923.

declivity slightly concave. The spines are pointed, not quite so long as their interval.

The lateral borders of the declivity are provided with a flat lamella, which runs up the spine nearly to the point, forming a sharp angle, descends to the border of the declivity in the centre, thence rising again as a small convex lamella covering the remainder of the border. There are no membranous appendices on the epinotum. Stalk of petiole slightly shorter than the node, which is higher than the postpetiole, and rounded above. Seen from above the node is elongate-oval with a small appendix at each posterior angle. Postpetiole oval, broader than long and than the petiole, and with a mass of spongy material filling the space between the posterior angles and the base of gaster. In profile the petiole has a flat appendix beneath, running along the whole segment, and the postpetiole has beneath a pair of semi-circular wing-like appendices. Mandibles shining, with plentiful minute punctures. Whole head densely reticulate-punctate and shining at the bottom of the punctures. The reticulation is less dense on the clypeus and more noticeable in the scrobes, where it is not obscured by the pilosity.

Sides of thorax and whole of first node similarly but less distinctly sculptured. Dorsum of thorax with a similar ground reticulation and several irregular longitudinal striae.

Base of epinotum similarly reticulate but with no striae. Declivity shining, with a superficial reticulation. Second node and gaster smooth and shining. At the base of the latter is a series of short longitudinal ridges. Legs reticulate.

Manjimup, W. Australia (Clark 467).

♂ ♀ ♀ in a nest of *Amblyopone australis*, Er.

Type W.C.C. Coll.

Shape of head intermediate between those of *godeffroyi* and *perplexa*, and the head more deeply emarginate behind than in the former. Joint 5 of funiculus in *godeffroyi* is shorter and thicker.

#### *Acropyga* INDISTINCTA, sp. nov.

♀ L. 2.8 mm.

Yellow, like a *Lasius flavus*; teeth of mandibles dark brown. Body covered with a short erect pubescence. A fringe of hair on clypeus, and a few on gaster, none on scape or tibiae.

Mandibles with 4 irregular teeth. Clypeus high in centre, the anterior border straight.

Head almost rectangular, but slightly wider in front, a fraction broader than long. The posterior angles rounded, occipital border straight. There is a slight depression in centre of occiput. Frontal area narrower and more rounded at the top than in *moluccana*. Eyes composed of about 6 facets, and placed on the anterior  $\frac{1}{2}$  of sides of head. The scape fails to reach the occiput by more than twice its breadth. Joints 2-8 of funiculus broader than long, the last joint about equals the preceding two.

Pro- and mesonotum form an even and high convexity.

Meso-epinotal suture very slight.

Declivity of epinotum feebly concave,  $1\frac{1}{2}$  as long as the base.

Shining; mandibles striate near the apex. Head covered with small piligerous punctures, a few, less pronounced, on promesonotum.

Mundaring, W. Australia (Clark 241, 307). Distinct from the other Australian species.

Types W.C.C. Coll.

*Camponotus* (*Myrmophyma*) *walkeri*, For., race *bardus*, For., var.  
ELONGATA, var. nov.

♀ major, L. 10 mm.

Dark castaneous, coxae, trochanters and femora yellow, mandibles, vertex and occiput, and patches on dorsum of thorax and gaster, darker.

In some specimens most of the upper surface of the body is brown.

Head slightly longer than broad (the reverse in *bardus*); the scapes extend

twice their width beyond occiput (reach it only in *walkeri* and in *bardus*).

Declivity of epinotum less abrupt, concave.

Ground reticulation very coarse on cheeks and clypeus, with irregular elongate punctures, most abundant on clypeus.

The spines on underside of tibiae, generally 5 in number, very short and at regular intervals.

♂ minor. Similarly coloured, but paler.

Head much longer, the sides straight, not convex as in *walkeri*, only slightly broader behind. Scapes longer, extending more than  $\frac{1}{2}$  their length beyond occiput.

Armada, W. Australia (Clark 204, 216).

Types W.C.C. Coll.

## NOTES ON COLLECTING, etc.

NOTES FROM THE NORTH OF IRELAND, 1923.—The past season here has been about the worst in my experience, of over thirty years. The winter of 1922-23 was exceptionally mild, with practically no frost or snow; and the early months of 1923 followed suit. Larvae of *Melitaea aurinia* were on the move at the end of February, and sawflies in bloom in sheltered spots; the second week in March "winter came"; bitterly cold, north-east and east winds raged day after day, with a short period of calm at rare intervals. This weather continued almost without a break until the middle of June, and Lepidoptera with few exceptions have been all too scarce.

The first butterfly to appear was *Aglais urticae*, several of which were flying along a weedy bank on March 3rd. *Euchloë cardamines* was observed on April 28th; a male at rest, low down in the shelter of a sallow bush, the species was fairly common at intervals during May, but not in its usual abundance, although I secured, just emerged, a well marked example of ab. *scheepdaeli*\*, so recently described in *The Record*, Vol. XXXV., page 102; also a fine female, ab. *radiata*, Williams, and two specimens of this sex, with the costal area pale yellow.

*Melitaea aurinia* was far from common on the wing in its special haunts; but a fine series was bred from larval nests collected the previous autumn and wintered in the open in the garden.

The spring brood of *Pararge aegeria* race *egevides*, was hardly in evidence, in localities where it usually abounds; and *P. megera* was not seen at all. *Pieris napi* was very late in appearing (May 10th), but a few nice dark females occurred. During June and early July, *Hepialus fuscinebulosa* (*velleda*) was flying in swarms everywhere at dusk, and several examples were secured with a series of pale white spots on the upperside of the hindwings.

During July and August, *Epinephele jurtina* being about the only abundant butterfly, I spent some time overhauling this species for aberrations, with fairly good results; more especially in some rough meadows near Lough Fea; here ab. *addenda*, Mousley, was frequent, some of the males having four super-numerary spots on the forewings, above as well as below, and the females large and distinctly marked

\* This appears to be very similar to ab. *caulosticta*, Williams, a female aberration.—T.G.

especially on the underside; many practically identical with var. *hispulla*; in other localities, males of this species were taken with a small ocellated spot on the hindwings above, near the anal angle; and at Lough Neagh, I captured a male with a bright fulvous band on the hindwings.

On July 13th, among the hills near the little town of Pomeroy, a thriving colony of *Polyommatus icarus* was discovered in a sheltered ravine; the males remarkable for the large proportion of the ab. *icarinus* occurring amongst those netted; the females do not show so much blue as Lough Neagh specimens, although several have the discoidals on all wings above, ringed with white or blue. *Ivo statices* was flying in some numbers in a meadow below this ravine, accompanied by *Zygæna filipendulæ*, several of the latter having the outer pair of spots confluent. Crossing a bog on the way home, *Coenonympha tiphon* and *Plusia interrogationis* were disturbed from the heather and captured.

Several visits were paid to "Rubens Glen" for *Dryas paphia* without result, although a couple of worn specimens were seen on the last visit here on August 28th. About this time, *Celaena haworthii* began to appear frequently at the bloom of *Glyceria fluitans*, growing in a small swamp near my house.

*Coenonympha tiphon* was observed again (though much worn) near Lough Fea on August 26th, and *Crambus margaritellus* was taken flying over the heather at dusk; on the 28th, *C. selasellus* was common in meadows.

A number of week-ends during the autumn months, were spent at Downhill on the north coast of Co. Derry; there is a comfortable hotel here, nestling at the foot of the cliffs which extend for some miles along the shore; the wide sandy flat of Magilligan is also close at hand. Several rare and interesting plants are found in this neighbourhood, such as *Dryas octopetala*, *Silene acaulis*, and *Saxifraga oppositifolia*; along the base of the cliffs the beautiful *Parnassia palustris* is abundant. Four species of butterflies were observed on the sand-hills, *Argynnis aglaia*, *Satyrus semele*, *Epinephela jurtina*, and *Polyommatus icarus*; the last only at all commonly; on ragweed at dusk *Agrotis vestigialis*, *A. tritici*, *A. præcox* and *Aporophyla nigra* (sparingly) occurred; but at the base and along the cliffs *A. nigra* (a fine black form) was abundant, often two or three on a single head of ragweed, accompanied by *Noctua glareosa* (a few rosy varieties) and *N. dahlia*, much lighter in colour than those found at Lough Neagh.

On my last visit here on October 6th, the ragweed yielded *A. nigra* still plentiful, but worn, *Agrotis epsilon*, *A. saucia*, several; *Aporophyla lutulenta* var. *lunenburgensis*, not common; *Polia chi*, and a single *Xylina socia*. In the day-time an occasional *Pieris brassicae* was still in evidence, although the cabbages everywhere were covered with the larvae in various stages of growth.

*Hydroecia erinanensis* was abundant in the swamp where *C. haworthii* occurred, but very uncommon elsewhere; for instance at Magilligan where the reputed foodplant *Iris* grows in quantity on the edge of the sand-hills, not a single specimen was noticed.

*Aglaia urticae* was still about on the scabious October 15th, and the larvae of *Phragmatobia fuliginosa* were sunning themselves, here

and there, preparatory to their winter sleep.—THOMAS GREER, Stewartstown, November 10th, 1923.

A FEW NOTES ON CONTINENTAL RHOPALOCERA.—It is perhaps rather late to be writing notes about the season 1922, but I find in my notebooks, one or two items which are perhaps worth recording. From May 24th to 31st, 1922, I was at La Ste. Baume, near Marseilles, with Mr. A. C. Smith, F.E.S., and Mrs. Smith. With the exception of one male *Iolana (Lycaena) iolas*, taken near the source of the Huveaune by Mr. Smith, the Rhopalocera met with were quite ordinary species. We were, however, pleased to meet with *Hesperia sidae* in some numbers. It was very wide-spread near the margins of woods on the Plan d'Aups; and when we ascended the ridge which bounds the Plan on the south, we found that *H. sidae* was still with us on the top—i.e., at an altitude of about 3000 feet. During the day-time we were continually chasing and capturing what we thought to be *H. sidae* only to find often that we had secured *Euclidia mi*. In the late afternoon *H. sidae* like so many Hesperiidids quite changed its habits and flew at a greatly increased pace, rushing hither and thither with no apparent desire to settle anywhere. It was interesting to note that *Euclidia mi* behaved in exactly the same fashion at exactly the same time. There would seem to be a clear case of mimicry here. It is not often one finds in the wilds, the body of a butterfly which had died a natural death; and it is therefore of interest to record that on May 27th, I came across the tattered remains of a large female *Euvanessa antiopa* in a clearing in the woods. The insect was lying upside down, the wings being depressed below the ventral level and forming an angle of about 90° degrees. The abdomen was shrivelled to insignificant proportions, the edges of the wings being much frayed and the wing surfaces very rubbed. It looked as if, all its natural force being spent, it had just slipped off a bush as life evaporated.

After leaving La Ste. Baume, we proceeded to La Grave, Hautes Alpes, and one or two observations made there may be worth recording.

The great feature was the vast abundance of a species of ant, *Formica cinerea*, Mayr. It was scarcely possible in large areas to find as much as a few square inches which did not contain one or more workers; and not content with thus covering the ground, they ascended all the trees and were to be seen descending with all sorts of insect prey, including Noctuid and Geometrid larvae, the latter sometimes in sections. No larva without a special protection, such as the nauseous larva of *Parnassius apollo* or the hairy larva of *Arctia caia*, would have had a chance against them. The more surprising was it therefore to find that this same species of ant, was in constant attendance on the larvae of *Polyommatus (Hirsutina) damon* on the flower-heads of sainfoin. Indeed, so regular was the habit, that it was only necessary to look for ants on the flower-heads and one or more larvae—large or small would surely be found.

Another much smaller ant of a reddish brown tint was at the same time found in attendance on larvae of *Plebeius argus*, but unfortunately, I did not bring home examples of the ant and consequently it has not been identified.

On one or two occasions larvae of *Argynnis niobe* were seen. They were literally running in full sunshine over the carpet of fallen

pine needles. I watched one closely and saw it make a bee-line for a tiny plant of *Viola tricolor*, seize it greedily with its first pair of legs, and proceed to devour it. If all the plants were as isolated and as tiny as this one, it would be easy to understand why the larva of *A. niobe* felt impelled to run hither and thither. Or was he running to escape the omni-present ant?—J. A. SIMES (F.E.S.), Loughton, Essex, November 14th, 1923.

NOTES ON *LIBYTHEA CELTIS*.—When staying on the Riviera in the spring of 1923 I found *Libythea celtis* local, but fairly abundant in its chosen haunts. On April 18th numbers of females were flying round the trees (*Celtis australis*), and as none of them were worth taking for cabinet specimens I devoted a few hours to searching for eggs. Most of the trees were in full leaf, but here and there were odd ones that were very much later, in fact the buds had hardly commenced to swell and at first glance I thought that they were dead. These however were the ones most favoured by *L. celtis*. The females were most daring, taking very little notice of being disturbed, dividing their time in depositing eggs and settling on the bare earth under the trees, flowers being entirely neglected.

The eggs are laid on the slender twigs close to a bud, and although I found as many as three round one bud, I think that they would be from several parents, and I observed them very closely and never saw two deposited on the same bud. By careful searching of the lower branches I found about 120 eggs in 3 hours and in one or two cases the tiny larva just hatched.

The eggs are spherical, light brown, very similar in colour to the twig and change very little in appearance towards hatching. They had all hatched by April 28th, so 10 days is about the period for this stage.

The small larvae at once eat little circular holes in the middle of the leaves, remaining in most cases on the underside. They go through their changes very quickly the first pupa appearing on May 10th, and the last on May 21st. When full fed the larvae are cylindrical, smooth, and without spines or protuberance of any description. The colour generally is dark brown broken by various green patches, often with a spiracular and dorsal stripe; but there was a great amount of variation, and some were almost of a uniform pale green.

In the last two instars they were somewhat restless dropping from the food plant when touched and hanging suspended by a thread. The threads were stretched from leaf to leaf uniting the food plant into a fairly compact mass and a most untidy wriggling brood they looked, quite unlike any other butterfly I have previously reared and reminding one very much of *Phigalia pedaria* or *Apocheima* (*Nyssia*) *hispidaria* when they are reared in quantity in captivity.

The pupae were mostly suspended from the top of the cage and hang without any girth or band, but they curve up again in a very curious fashion, so that the extreme point of the front apex almost touches the same level as the point of attachment.

The pupae again show the same amount of variation as the larvae, mottled gray being the general tone but others being a clear light green.

The first imago appeared on May 31st, and the last on June 10th.

Altogether I had out 110 fine examples well up to size, but not showing any of the variation which was so pronounced in the larval and pupal stages. They were perhaps a tiresome brood to rear in a bedroom, but they are certainly very healthy and I feel well repaid with such a fine series of this rather local southern species.—A. SIMMONS, 42, Loughborough Road, West Bridgford, Nottingham.

NOTES ON *Pyrgus proto*.—I spent a few weeks at La Ste Baume (Var.) in the summer of 1923, and acting on the advice of Mr. H. Powell of Hyères, who very kindly gave me much useful information of the district, at once commenced to search for larvae of *Pyrgus proto*. The foodplant *Phlomis herba-venti* grows in patches over a large area, and larvae were first found on June 6th. They draw the leaves of the foodplant together with a few threads, forming a rough kind of tent and live in this little retreat. At this date they were in all stages from a few days old to nearly full fed and as they were fairly abundant only the large ones were taken. They fed very little and to a great extent did not leave their original cover, and I began to fear all was not well, but yet only odd ones died. About July 1st, a few left their retreat and spun a slight web on the net of the cage and this gave me an opportunity of observing their movements. They still remained very quiet in spite of a temperature of 80° and on July 11th, I saw the first pupa.

The first imago emerged on July 20th, and at the same time the species began to appear in the open.

Odd full fed larvae were occasionally picked up until early July, and on the 23rd of that month I left for England with the whole lot both larvae and pupae in a cage without food. With our lower local temperature they seemed to advance slower than ever, never feeding, and a few larvae were still visible up to the middle of September. However in all I had a nice series, the last imago appearing on October 28th, but this was a laggard all the others being out by the end of September.

When small the larvae are nearly black, but when full fed are a pinkish white with a black head.

The pupae which in two cases out of three were formed inside the original leaves are rather slender, dusted with a purple bloom and have very prominent eyes. It will be seen therefore that five or six weeks lapse before the full fed larva pupates, and out in the open probably none would feed after mid July, as the food plant is by that time burnt up by the sun.—LD.

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## CURRENT NOTES AND SHORT NOTICES.

The following Fellows have been nominated as Officers and Council of the Entomological Society of London for the Session 1924-1925:—*President*, E. E. Green, F.Z.S. *Treasurer*, W. G. Sheldon, F.Z.S. *Secretaries*, S. A. Neave, M.A., D.Sc., F.Z.S., H. Eltringham, M.A., D.Sc., F.Z.S. *Librarian*, H. J. Turner. *Other Members of Council*, E. C. Bedwell, G. C. Champion, F.Z.S., A.L.S., J. E. Collin, J. Davidson, D.Sc., F.L.S., K. Jordan, Ph.D., F. Laing, R. W. Lloyd, G. A. K. Marshall, C.M.G., D.Sc., F.R.S., W. G. F. Nelson, Professor E. B. Poulton, M.A., D.Sc., F.R.S., W. Rait-Smith, H. Willoughby-Ellis, F.Z.S.

The following members are recommended to be appointed Officers and Council of the South London Entomological and Natural History Society for the Session 1924-25:—*President*, N. D. Riley, F.E.S., F.Z.S. *Vice-Presidents*, E. J. Bunnett, M.A., F.E.S., T. H. L. Grosvenor, F.E.S. *Treasurer*, A. E. Tonge, F.E.S. *Librarian*, A. W. Dods. *Curator*, S. R. Ashby, F.E.S. *Assistant Curator*, T. L. Barnett. *Hon. Editor of Proceedings*, H. J. Turner, F.E.S. *Hon. Secretaries*, Stanley Edwards, F.L.S., etc. (*Corresponding*), H. J. Turner, F.E.S. *Recorder of Attendances*, L. E. Dunster. *Hon. Lanternist*, A. W. Dennis. *Council*, H. W. Andrews, F.E.S., K. G. Blair, B.Sc., F.E.S., S. A. Blenkarn, F.E.S., A. W. Buckstone, F. B. Carr, E. A. Cockayne, M.D., F.E.S., A. W. Dennis, O. R. Goodman, F.E.S., E. Syms, F.E.S.

Part 1 and 2 of the *Annales Soc. Ent. de France* for 1923 have just appeared, and contain (1) The genus *Otiorrhynchus* of Gallow-Rhénans by Mr. Hustsche; (2) The Chironomides of tropical Africa, by M. Kieffer; (3) Remarks on some Mosquitos by M. Séguy. There are two plates of details and numerous figures in the text.

The *Verhand zool.-bot. Gesell.* of Vienna consists of 176 pages of Proceedings and 124 of memoirs. The entomological papers in the latter deal with Chalcids (*Encyrtidae*) and Gall-mites (*Oxypleurites*). In the former we find interesting notes, with figures, on the eggs of *Erebia eriphyle* and *E. pharte*, a figure of a remarkable ab. of *Aretia caja*, the Lepidopterological experiences in a journey to Swedish Lapland, a similar account of a holiday in Corsica, and other smaller items. There are many figures.

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## SOCIETIES.

### THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.

*August 9th.*—Mr. Step exhibited a living *Prionus coriarius* (Col.) from Ockham.

Mr. H. J. Turner, the life-history of *Coleophora troglodytella*, of which the larvae were found by Dr. Robertson at Lyme Regis, a short series of *Emmelesia affinitata* from the same locality, and a long bred series of *Eupithecia dentata* (*campanulata*), from larvae found at Ranmore.

Mr. Blenkarn, the extremely local *Dryops anglicanus* (Col.) taken at Wicken in May, *D. auriculatus* from Mickleham, and *Balaninus btulæ* from Hayes.

*August 23rd.*—Mr. R. Adkin, a series of *Xanthorhoë galiata* from ova laid by an Eastbourne female, and pointed out a marked difference in tone of colour of the central band in a portion of the brood, and a series of *Coleophora lineolea* with their cases, from larvae feeding on *Stachys lanata* growing in his garden border.

Mr. T. H. L. Grosvenor, a unique and remarkable specimen of *Zygaena filipendulæ*, taken by him at Royston with the R. hindwing an almost exact duplication of the forewing in size, marking, colour and neuration.

Mr. S. R. Ashby, an extremely melanic specimen of *Hadena dentina* (*nana*), taken by him at Oban.

Dr. H. S. Fremlin, a plant of *Datura stramonium*.

Mr. B. S. Williams, Coleoptera from Beds., including *Cassida fastuosa*, *Euconnus denticornis*, etc., and *E. hirticollis*, from Wicken.

Mr. Enefer, several items of interest from Switzerland, *Polistes gallica* (Hym.), ♂ and ♀ of the Solitary Ant, *Mutilla europaea*, *Aromia moschata*, and several large species of spiders.

September 13th.—Mr. H. Candler exhibited a collection of Rhopalocera captured in Natal during 1900-1-2. He subsequently presented them to the Society's Collections.

Mr. A. E. Tonge, the much retarded parasitised larva of a Zygaenid found at Lewes on September 9th; the Dipteron *Echinomyia grossa* bred from a larva of *Macrothylacia rubi*: a most abnormal and irregularly marked specimen of *Cleora jubata* (*glabraria*): etc.

Mr. Blenkarn, the Longicorn Coleopteron *Leptura rubra* from Norwich, new to Britain; and the local beetle *Zabrus gibbus* from near Brighton.

Mr. O. R. Goodman, an *Epinephela jurtina* race *hispulla* having an irregular pale patch on the forewing: and an *Argynnis niobe* *orientalis* of unusual size from S. France.

Mr. T. H. L. Grosvenor, a number of the Indian *Kallima inachus* and referred to the extensive range of variation of the underside leaf pattern, and the invisibility when settled.

Mr. Enefer, the large thistle-frequenting *Cetonia* from Zermatt, the Longicorn *Saperda scalaris* from a tree trunk at Chamonix, and *Trichius fasciata* from knapweed heads at Zermatt.

Mr. Carr, the larvae of *Stauropus fagi* from birch at Oxshott, of *Asthena blomeri* from Chalfont Road, and *Leptoméris-imitaria* from ova laid by a ♀ taken at Eynsford.

Mr. Hy. J. Turner read a note on the melanic aberration of *Hadena dentina*, recently exhibited, stating that this form was named *latenai* in 1837 and was considered very rare in this country, and pointed out that by priority *nana*, Hufn. was the species name. He also exhibited a box of various species of *Erycinidae* from S. America, illustrating the most prominent genera.

#### September 27th.—EXHIBITION OF ORDERS OTHER THAN LEPIDOPTERA.

Mr. W. J. Lucas exhibited coloured drawings of the rare orchid *Spiranthes aestivalis*, of the naiad and details of *Libellula quadrimaculata* (Odon.), and of the rare *Mecostethus grossa* (Orth.), all from the New Forest.

Mr. Priske, varied series of land-shells, mainly from Swanage and Littlehampton.

Mr. Bunnnett, ova of *Petrobia lapidum* (Myr.); new species of Orthoptera from Jamaica; and Coleoptera, *Centhorrhynchidius horridus*, *Coccinella conglobata*, etc.

Mr. H. W. Andrews, his collection of British *Tabanidae*, largely from Kent.

Mr. B. S. Williams, numerous species of Coleoptera, mainly from Harpenden and Beds.

Mr. K. G. Blair, "Some Insects of the Sandhills," being notes on his holiday: mostly Hymenoptera and Coleoptera: *Megachile circumcincta*, *Coelioxys elongata*, *Andrena albicans*, *Psammophila hirsuta*, *Pom-*

*pilus plumbeus*, *P. spissus*, etc. (Hym.), *Sitona grisea*, *Otiorrhynchus atroapterus*, *Philonthus gibbum*, *Crypticus quisquilius* (Col.), etc.

Mr. S. A. Blenkarn, some forty species of local Coleoptera taken by him chiefly in 1921-3.

Mr. S. R. Ashby, the very extensive and varied series of the Homopteron *Philaenus spumaria*, collected by the late Mr. W. West.

Mr. H. Moore, the three species of mole-cricket, *Gryllotalpa vulgaris*, Europe, *G. orientalis*, Africa, and *G. borealis*, America, and many Coleoptera from Nairobi.

Mr. Main, many details from S. France and the Eastern Pyrenees: *Mantis religiosa*, green and brown forms; *Empusa* sp., immature; *Chelidura dilatata*, an earwig with very curved forceps; an ant-lion, *Myrmeleon*; a salamander, etc.

Mr. Stafford, aberrations of *Agriades coridon* from Royston.

Mr. Tonge, *Agriades* f. *polonus*, considered a hybrid between *A. coridon* and *A. thetis*, from Reigate.

October 11th.—A special exhibition and discussion of *Coenonympa pamphilus*.

Series were exhibited by Messrs. Tonge, Newman, Coulson, Grosvenor, O. R. Goodman, A. de B. Goodman, Capt. Crocker, Frohawk, Buckstone, Barnett, Turner for Capt. K. J. Hayward, Miss Lock for H. B. Williams, and Hy. J. Turner. Among the races and forms shown were light and dark forms, apical spot absent, apical spot doubled, additional spots on forewings, ditto on hindwings, ab. *pallida*, ab. *bipupillata*, Somerset race with extra spots, dark fascia on underside of forewing, richly ringed spots, pale blotched forms, basal suffusion on wings, very dark green underside hindwings, etc., mainly from Britain; race *lyllus* almost unicolorous underside hindwing, very marked dark marginal borders, hindwing suffused with black, S. France with more rounded wings, L. Maggiore race darkly marked in distal margin and apical spot. Mr. Hy. J. Turner read from his notes extracts dealing with the North single brooded race, the double brooded races of North Central Europe, Central Europe, South Europe, and extreme South Europe as described by Dr. Verity, and by a diagram showed how Dr. Verity explained that the five fresh emergences near Florence really were only two broods with a partial third.

Mr. Step, a spider (*Epeira* sp.) killed with methylated spirit, to which had been added about 10% of a saturated solution of bichloride of mercury, and left in it for a week; the specimen showed little if any contraction or loss of colour.

Mr. Frohawk, two examples of *Erynnis alceae* taken this year in Surrey.

Mr. Blenkarn, *Chrysomela marginalis* from Brighton, an all black var. of *Adalia bipunctata* from Coulsdon, and *Apion semivittatum* from Deal, a rare Central and South European species (Col.).

Mr. Newman, a 2nd brood living specimen of *Boarmia gemmaria* (*rhomboidaria*).

Mr. Step, for Mr. Parker, specimens of the "Resurrection Plant," *Selaginella* sp., from Mexico.

Mr. Enefer, the Bird's Nest Fungus, *Cyathus striatus*.

Mr. Frohawk reported that *Anosia plexippus* had occurred in Sussex this autumn.

## THE ENTOMOLOGICAL SOCIETY OF LONDON.

October 3rd, 1923.—GIFTS TO THE SOCIETY.—The Treasurer called attention to the ten new portraits added to the Society's collection and now hung on the walls of the Meeting Room, including one of the late Secretary, Mr. H. Rowland-Brown. Miss Rowland-Brown, who was present as a visitor, addressed the meeting and expressed her thanks for the honour conferred on her late brother.

RUSSIAN ENTOMOLOGICAL SOCIETY.—The Secretary read a letter from the Russian Entomological Society thanking the Society for the financial help sent to Russian entomologists in distressed circumstances.

EXHIBITIONS.—Mr. A. E. Tonge exhibited *Agriades thetis* ab. *polonus*, Zell., and expressed the opinion that it is a hybrid between *coridon* and *thetis*.

Mr. Donisthorpe exhibited some rare British beetles, including *Arena octavii*, Fauv., and *Cryptophagus schmidti*, Strm.

Mr. G. T. Bethune-Baker, on behalf of Dr. Jefferis Turner, exhibited a remarkable Australian Oecophorid, *Neossiosynoeca scatophaga*, living in parrots' nests.

The Rev. F. D. Morice exhibited an example of the sawfly, *Pachyprotasis rapae*, L., with the tarsi, etc., of one leg duplicated.

Dr. K. Jordan exhibited some remarkable Lepidopterous cocoons from South America.

Mr. T. H. L. Grosvenor exhibited a teratological specimen of *Zygaena filipendulae*, the R. hindwing being a complete reproduction of the R. forewing.

Mr. H. M. Edelsten exhibited a series of varieties of *Arctia villica*.

Professor E. B. Poulton, F.R.S., exhibited a remarkable Lepidopterous leaf-miner from South Nigeria.

The Rev. G. Wheeler exhibited examples of *Agriades* f. *polonus*, Zell., and also, on behalf of Mr. Prideaux, both sexes of the second brood of *A. hispana*, H.-S., reared from eggs sent from Florence.

PAPERS.—1. On Scent Organs in the Genus *Hydroptila* (Trichoptera), by Mr. Martin E. Mosely.

2. Coleoptera from the Seychelles, *Lampyridae*, *Helodidea*, *Gantheraidae*, *Melyridae* and supplement to *Cleridae*, by Mr. G. C. Champion.

3. The Dragonflies (Order Odonata) of Fiji, with special reference to a collection made by Mr. H. W. Simmonds, F.E.S., in the Island of Viti-Levu, by Dr. R. J. Tillyard.

October 17th.—OBITUARY.—The Chairman announced the death of the Hon. N. C. Rothschild, a former President of the Society, and a vote of condolence with his relatives was passed. A vote of condolence with Mr. G. T. Bethune-Baker on the death of Mrs. Bethune-Baker was also passed.

ELECTION OF FELLOWS.—The following were elected Fellows of the Society:—Mr. S. N. Chatterjee, Forest Research Inst., Dehra Dun, U.P., India; Mr. J. H. Hutchinson, M.A., Challoner House, Cocker-mouth; Mr. G. L. R. Hancock, Trinity College, Cambridge.

EXHIBITIONS.—Mr. P. A. Buxton made some remarks, illustrated by diagrams, on Heat, Drought, and some Desert Insects.

Mr. N. H. Joy exhibited a number of insects found in bats' dung,

and also some rare beetles taken at Windsor associated with the ant *Acanthomyops brunneus*.

Mr. L. W. Newman exhibited a supposed hybrid between *Polyommatus thetis* and *P. icarus*, and other Lycaenids.

Mr. T. H. L. Grosvenor exhibited a number of abnormal specimens of *Zygaena* spp.

Mr. A. E. Tonge exhibited a female variety of *Cleora glabraria* from the New Forest.

Rev. G. Wheeler exhibited a remarkable form of *Parnassius apollo*.

Mr. P. Harwood exhibited living examples of *Pytho depressus* (Col.).

Mr. A. Dicksee exhibited rare butterflies from Formosa and S. America.

Professor E. B. Poulton, F.R.S., exhibited a female of *Hypolimnas walbergi* bred from a captured female of the same form, at Durban. Also a remarkable variety of the dry-season form of *Precis octavia* form *sesamus*, from Nairobi, and photographs of an Ascalaphid larva from the same place.

Dr. G. D. Hale Carpenter exhibited, and made some remarks upon, a number of butterflies from the Semliki Valley, Western Uganda.

Dr. F. A. Dixey, F.R.S., discussed the disappearance of cryptic patterns in butterflies during flight, and exhibited some examples of *Pierinae* to illustrate his remarks.

PAPERS.—1. On the early stages of *Chrysidia ripheus*, by Dr. H. Eltringham.

2. On the tympanic organ in *Chrysidia ripheus*, by Dr. H. Eltringham.

3. On the Genitalia in *Sabatinca* and allied genera (Lepidoptera), with some observations on the same structures in the Mecoptera, by Mr. Phillpott.

4. On the African species of the Dynastid genus *Heteronychus* (Col.), by Mr. R. W. Jack.

November 7th.—ELECTION OF FELLOWS.—The following were elected Fellows of the Society:—Mr. G. Britten, Hiwaka, Nelson, New Zealand; Mr. J. E. Campbell-Taylor, Havisthorpe, Southover, Lewes, Sussex; Mr. C. E. Clarke, c/o G. Hous, Esq., 452, George Street, Dunedin, New Zealand; Mr. D. A. Dewar, M.B., C.M., Altyre House, Stanley, S.O., Co. Durham; Mr. A. C. Halliwell, St. Thomas's Hospital, Westminster; Mr. F. A. Mitchell-Hedges, F.Z.S., The Bridge House, Sandbanks, Parkstone, Dorset; Mr. Gordon Newland, 19, Bath Road, Bedford Park, W.4; Miss Janet W. Roff, M.Sc., the University of Melbourne, Victoria, Australia; Mr. Sisir K. Sen, B.Sc., Agricultural Research Institute, Pusa, India; Mr. B. Temperley, Literary and Philosophical Society, Newcastle-on-Tyne; Mr. A. Twidle, N.S.A., The Rowans, Godstone Green, Surrey.

EXHIBITIONS.—Mr. H. Donisthorpe exhibited larvae, pupil cells, and adults of *Platyrhinus resinosus*, Scop., and made some remarks on its life-history.

Mr. P. A. Buxton described some observations on the factors controlling harvesting in an ant, *Aphenogaster barbara*, L.

Mr. C. Talbot, on behalf of Mr. J. J. Joicey, exhibited a new *Papilio* from the Philippines, allied to *P. xuthus*, L.

The President exhibited an unusual aberration of *Coenonympha pamphilus* from the Delamere Forest.

Professor E. B. Poulton, F.R.S., communicated some further biometric notes on Lepidoptera and other insects from the Federated Malay States, by Capt. H. M. Pendlebury.

He also exhibited and made remarks upon the remarkable snake-like appearance of an African Sphingid larva in the terrifying attitude, forwarded by Dr. V. G. L. Van Someren.

Dr. H. Eltringham, who illustrated his remarks with lantern slides, gave some account of his paper on the "Early stages of *Chrysidia ripheus* and the tympanic organ in that moth."

November 21st.—The Secretary announced the Officers and Council for 1924, nominated by the Council.

ELECTION OF FELLOWS.—The following were elected Fellows of the Society:—Mr. M. W. P. L. Cameron, Imperial College of Science and Technology, South Kensington, S.W.; Mr. M. A. B. Leon, Imperial College of Science and Technology, South Kensington, S.W. 7; Mr. G. H. Marillier, 37, St. John's Wood Park, Hampstead, N.W. 3; Mr. A. Valentine, Grand Hotel, Herne Bay, Kent; Lt.-Col. Richard M. West, M.D., D.Sc., C.B.E., Wootton Bridge, Isle of Wight.

GIFTS TO THE SOCIETY.—The Treasurer announced that a legacy of £1,000 had been left to the Society by the late Hon. N. C. Rothschild.

EXHIBITIONS.—Mr. H. C. Holford exhibited some examples of British Lepidoptera, including a remarkable one of *Triphaena pronuba*, with practically the whole of the hindwings of a deep black-brown.

Dr. K. Jordan exhibited an example of *Xenopsylla cheopis* with a double spermatheca (Siphon).

Professor E. B. Poulton, F.R.S., quoted some observations by Mr. A. G. Williams, on the absorption of human perspiration by a Lycaenid butterfly in the Philippines. He also remarked upon the leaf-like appearance of a Neotropical Tettigoniid and a Thyridid moth from Costa Rica. He also exhibited and made remarks upon some remarkable cocoons of a spider from the Island of Reunion, and a nest of an East African gregarious spider crowded with the remains of a male Pierine butterfly.

Mr. J. J. Lister, who illustrated his remarks with lantern slides, exhibited a number of aberrations of European butterflies, chiefly *Lycaenidae*, and made suggestions as to the classification of the kind of aberration he showed.

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## REVIEWS AND NOTICES OF BOOKS.

BUTTERFLY LORE.—By H. Eltringham, M.A. (Cantab.), M.A., D.Sc. (Oxon.), F.E.S., F.Z.S.—Oxford, Clarendon Press, 180 pp., price 4/6 net.

"The present work . . . is an attempt to place in the hands of the general reader a simple, yet sufficient, account of the more interesting features in the structure and life-histories of the insects of which it treats."

We should like to see this work in the hands of every school boy—say from the fourth Form upwards. Moreover, the intelligent part of the general public should certainly acquire copies, as after treating of the egg, caterpillar, and chrysalis stages of a butterfly's life, there is an excellent chapter on insect "Senses," another on "Scents," and yet

another on "Concealment, Mimicry, and Polymorphism," all of them being good science, clearly put, and easily understandable.

The present generation can count itself fortunate that Dr. Eltringham has found the time to give it some of the fruits of his studies in such an accurate and delightful form. This, in spite of the fact that he restricts himself to making his treatise "popular," and in doing so is only able to lift "a small corner of the veil" of a very fascinating study.

Most of the ground covered by this volume has been traversed many times before, but never quite in the same way. The selected illustrations are admirably adapted for their purpose and beautifully reproduced. The information conveyed therein gives the answers to such queries as "What is the difference between a butterfly and a moth?" "How does a moth find its mate in the dark?" "What is the meaning of the patterns and colours of the caterpillars and their butterflies?" "Have they senses similar to our own?" . . . and more. We hope this little work will have a wide circulation, and that there will be a call for many editions.

Congratulations are due to the writer for the excellence of his work, and to the great British Public, in that it now has the means of acquainting itself with many of Nature's secrets, and if such studies be continued, life will be enriched beyond conception.—(H.E.P.)

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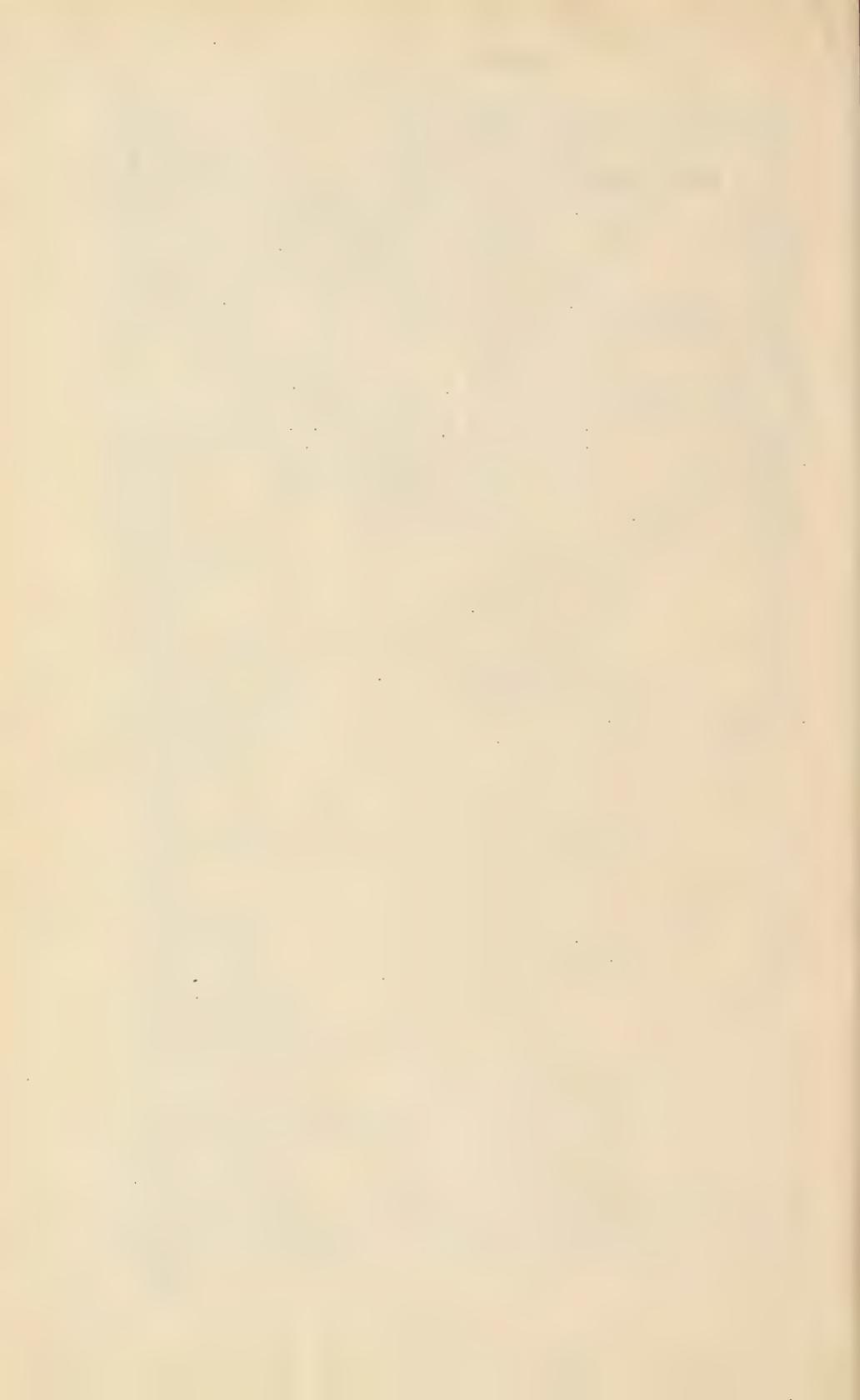
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## CORRIGENDA, ETC.

Corrections in the spellings of specific names and in the genera used are made in the Special Index above.

Page 15. The locality for *H. simplana* should be Kent, and not N. of Scotland.







## Races and Seasonal Polymorphism of the Grypocera and of the Rhopalocera of Peninsular Italy.

(ANNOTATED LIST.)

By ROGER VERITY, M.D., and ORAZIO QUERCI.

### EXPLANATORY NOTES.

After each name the locality of "typical" specimens is quoted from the original description of its author and it is indicated by inverted commas (" . . . "). When this locality is not within the Italic Peninsular subzone we are dealing with, it is enclosed by square brackets [ ], whereas curved brackets ( ) are used simply when convenient for other purposes.

When a named variety has subsequently been shown to be a distinct species, we have adopted the method of enclosing in brackets the author of the name and of placing after it the name of the author who has discovered the specific characters.

To save space we use the abbreviations of "C.It." and "P.It." for "Central Italy" and "Peninsular Italy," respectively. Geographically the division between Central Italy and Southern Italy is the line drawn across the peninsula from the mouth of the Garigliano (north of Naples) to that of the Sangro, north of the Gargano promontory, on the Adriatic. Entomologically the distinction between these two regions, which old authors, like Curò in his "*Saggio di un Catalogo dei Lepidotteri d'Italia*" (published in the *Bull. Soc. Ent. Ital.*, from 1875 to 1889), make use of, seems absolutely artificial and useless, because real differences only exist between Calabria and the rest of the peninsula. A certain number of species, and chiefly those, like the *Erebia*, which only inhabit alpine-like surroundings in mountain-masses, do stop short at about the level of the line mentioned above, but in many cases in this List we give "C.It." simply because the South of Italy is much less known to Lepidopterists, and many species exist there which have not been recorded of late with sufficient certainty. We make it a point not to quote any locality of which we have not made quite sure. As a rule we give those where one of us has collected and whence, in most cases, specimens are preserved in the "Verity" collection. This we have had to do, not only to be perfectly accurate in our statements, but also because lists of the past give no clue as to the features of races and generations, and are thus quite useless from our new standpoint. One is thus compelled to start observations afresh to make a region known. When information is drawn from other authors, we give their names; we are responsible for the rest. For the same reason we have not been able to deal with localities in Liguria, where we have not collected, although, as Verity has mentioned in his Introductory Remarks to this list (*Ent. Rec.*, vol. xxxiv., page 179), from the point of view of its Lepidoptera, it should be joined on to Peninsular Italy. What Verity has seen of it, collecting round the Gulf of Spezia and at Levanto, the information received from Dr. Rocci of Genoa and the specimens sent to us by him clearly show that its species are the same as in Northern Tuscany and that their races are also usually the same. The few races peculiar to Liguria, which have been described, we mention in our Notes. In connection with the altitudes we give, we must mention that they are

those which in our experience are the most usual, but no doubt some will be altered by further observations and, anyhow, we have seen exceptions, both in the sense of single species found at unusual altitudes and of localities where quite a number of species exist lower or higher than usual, or where races exhibit features proper, as a rule, to other levels. For instance, amongst the localities we shall often mention in the following List, it will be noticed that on *Mt. Conca*, on the northern slopes of *Mt. Morello*, near Florence, at 400 m., and in the little basin of *Firenzuola* (prov. of Florence), at 500 m., quite a number of species produce their mountain race; on the contrary, at *Vallombrosa* (also near Florence) one meets at 900 and 1000 m. with species and races very unusual at so high a level, owing to its southern exposure [List of its Lepidoptera, by Verity, in *Boll. Soc. Ent. It.*, xxxviii. (1907)]. Along the western coast of the peninsula there is a strip of swampy grounds and marshes, which produces unusually melanic races in several species: *Forte dei Marmi* and *the mouth of the Arno* are the two localities of this sort which Verity has collected in, so that they often appear in this List [List of the Lepidoptera of the former, by Verity, in *Boll. Soc. Ent. It.*, xxxvi. (1905)]. We must mention particularly the entomologically very rich and interesting *Pian di Mugnone*, about three miles north of Florence, which from m. 100 rises to 600 on *Mt. Fanna*; in the spring and, to a certain extent, again in the autumn it is covered with an abundant and varied vegetation; in the summer it is blazingly hot and gets extremely parched; the result is that insects are abundant and that those which emerge in summer are in many species as southern in character as the most extreme forms produced in southern Italy, with the exception, of course, of the peculiar Calabrian races. A large number of Verity's "types" are from the *Pian di Mugnone* and it is there we have made out the number of generations and their features in several species by methodical collecting [Tables of emergence through the year published in *Boll. Soc. Ent. It.*, xlvi. (1915), xlviii. (1917), and l. (1919). See also list of races by Querci in *Ent. Rec.*, xxxii., p. 223 and xxxiii., p. 72]. Alpine-like surroundings exist in Central Italy in the huge mountain-mass, which from the *Sibillini Mts.*, in the Marche, stretches across the *Abruzzi* with the *Gran Sasso d'Italia* and the *Majella*. The Quercis have collected during many years in the *Sibillini*, and *Bolognola*, where they resided at 1200 m., is on this account often mentioned by us [List of the Grypocera and Rhopalocera by Verity in the *Boll. Soc. Ent. It.*, xlvii. (1916). See also list by Querci in *Ent. Rec.*, xxxiii., p. 70]. Verity has collected at 1300 m. on the *Abetone Pass (Boscolungo)* in the Tuscan Apennines, where the fauna is far from being as alpine as in the preceding, notwithstanding the altitude [List of the Grypocera and Rhopalocera by him in the *Boll. Soc. Ent. It.*, xlv. (1914)], and at *Piteglio*, m. 700, in the same mountains [List of Lepidoptera by him in *Boll. Soc. Ent. It.*, xxxvi. (1904)]. Verity was in the *Isle of Elba* in 1908 and the Quercis in 1916, and the former has published two lists of the Grypocera and Rhopalocera in the *Boll. Soc. Ent. It.*, xl. (1909), and xlviii. (December, 1916). In Tuscany the Quercis have collected also in the prov. of *Lucca* in the *Camaione* and *Fegana Valleys* and in the *Apuane Alps* (see list of *Mt. Sunbra*, by Querci, *l.c.*, p. 25). In the *Roman Campania* and *Latium* Querci has collected in the past in many

localities [Turati has published a list of the Lepidoptera collected by him in the *Aurunci and Mainarde Mts.* (prov. of Caserta), in the *Atti. Soc. Ital. Sc. Nat.*, liii. (1914)], and recently in the *Mainarde*, in the *Atina* district [List by Verity of the *Zygaenides*, *Grypocera* and *Rhopalocera* in *Boll. Lab. Zool. gen. e agraria in Portici*, xiv. (1920)]. *Calabria* has been visited twice by Querci (see his list of the *Coast Range*, about *S. Fili*, in *Ent. Rec.*, xxxiii., p. 12). Other local lists published in this century, which we have quoted are: Stefanelli's *Cat. Illustr. Ropal. Toscani* in *Boll. Soc. Ent. It.*, xxxii. (1901); Rostagno and Zapelloni's *Lepidopt. Faunae Romanae* in *Boll. Soc. Zool. Ital.*, 1908 to 1912; Stauder's *Sammelreise nach Unteritalien in Zeit. wissensch. Insektenb.*, 1914 and 1915; Stauder's *Lepidopt. aus dem Aspromonte—Geb., l.c.*, 1915 and 1916; Turati's *A 1000 m. sull'Appennino Modenese* (on boundary with Tuscany) in *Atti Soc. Ital. Sc. Nat.*, lviii. (1919); Rocci's *Osservazioni sui lepidotteri di Liguria: Papilionidae et Pieridae* in *Soc. Lig. Sc. Nat.*, xxx. (1919) and xxxi. (1920). These and other authors, such as Oberthür and Frühstorfer, on a few occasions, have published also notes and descriptions dealing with single species and races, so that the amount of literature of this century in connection with Peninsular Italy is quite considerable. We hope we have not overlooked anything concerning races and generations. As to times of emergence, we have thought it advisable not to deal with them, because to be of practical use we should have had to give those of each locality separately and this would have been a very bulky and at the same time a very incomplete attempt, whilst, on the other hand, broad, inclusive statements can much better be inferred from the general rules Verity has worked out in his papers on this subject in *Ent. Rec.*, vol. xxxi. (*The various Modes of Emergence and the Number of Annual Broods of the Grypocera, and of the Rhopalocera*), and in vol. xxxii. (*On the Emergence of the Grypocera and Rhopalocera in relation to Altitude and Latitude*), to which we refer our readers.

Superfamily: *Grypocera*.

Family: *Hesperiidae*.

Subfamily: *Hesperiinae*.

Tribe: *Hesperiidi*.

*Nisoniades tages*, L. ["Habitat in Europa," with no quotation.]

(a) race *subclarus*, Vrtý.—I. gen. *tages*, L.; II. gen. *subclarus*, Vrtý., *E.R.*, 1921, p. 172 ["S. Tyrol"]—C.It., in damp localities.

(b) race *clarus*, Carad.—I. gen. *tages*, L.; II. gen. *clarus*, Carad., *Iris*, 1895, p. 61. ["Amasia, in Asia Minor."]—P.It., up to 1200m., in dry localities.

*Erynnis alceae*, Esp. ["Erlangen, in Frankonia."]

(a) race *australis*, Z.—I. gen. *alceae*, Esp.; II. gen. *australis*, Z., *Isis*, 1847, p. 285 ["Sicily (Syracuse, Messina, Catania) from April to September"]; III. gen. *australis*, Z.—P.It., up to 1200m.

*Note*.—The two forms are nearly always found together but *alceae* prevails largely in the first generation and *australis* in the two others.

*Erynnis altheae*, Hb. ["Germany, not in all regions."]

(a) race *australiformis*, Vrtý.—I. gen. *altheae*, Hb.; II. gen. *australiformis*, Vrtý., *E.R.*, 1919, p. 27, "Tuscany"; III. gen. *australiformis*, Vrtý.—P.It., up to 1200m.

*Erynnis lavatherae*, Esp. ["France and Switzerland."]

- (a) race *australior*, Vrty., *E.R.*, 1919, p. 27 ("Florence, at 200m.").  
—P.It., up to 1200m.
- Erynnis baeticus*, Rbr. ["Andalusia."]  
(a) race *rostagnoi*, Vrty., *E.R.*, 1919, p. 27.—"Oricola (Abruzzi),"  
and Sibillini Mts. (Marche), 800 to 1200m.
- Note*.—In the South of France three generations are known; in Italy this species is so extremely scarce that nothing can be inferred from the few specimens collected.
- Hesperia sidae*, Esp. ["Volga, in Russia."]  
(a) race *occidentalis*, Vrty., *E.R.*, 1919, p. 27 ("Florence, at 200m.").—C.It., up to 700m.
- Hesperia carthami*, Hb. ["No text."]  
(a) race *carthami*, Hb.—Sibillini Mts. (Marche), and Calabrian Coast Range, 500 to 1500m.
- Note*.—This species is said to have two generations in some localities of the Alps, but here it has only one.
- Hesperia armoricanus*, Obthr. ["Rennes, in N.W. France."]  
(a) race *fulvoinspersa*, Vrty.—I. gen. *armoricanus*, Obthr.; II. gen. *fulvoinspersa*, Vrty., *E.R.*, 1919, p. 27 ("Florence, at 200m.").  
—P.It., up to 1200m.
- Hesperia onopordi*, Rbr. ["Andalusia."]  
(a) race *fulvotincta*, Vrty.—I. gen. *onopordi*, Rbr.; II. gen. *fulvotincta*, Vrty., *E.R.*, 1919, p. 27 ("Florence, at 200m.").—P.It. up to 1200m.
- (b) race *quercii*, Obthr., *Ét. Léop. Comp.*, vi., 107, figs. 1328-30 (1912).—"Polleca, m. 700, in Aurunci Mts. (Caserta)."
- Hesperia alveus*, Hb. ["Germany."]  
(a) race *centralitaliae*, Vrty., *E.R.*, 1920, p. 4.—Sibillini Mts. (Marche), at 1300m.
- Hesperia foulquieri*, Obthr. ["Marseilles, in S. France."]  
(a) race *picena*, Vrty., *E.R.*, 1920, p. 4.—Sibillini Mts. (Marche), 1200m.—C.It., up to 1200m.
- Hesperia serratulae*, Rbr. ["Andalusia."]  
(a) race *serratulae*, Rbr.—Sibillini Mts. (Marche), 1500m.
- Hesperia malvoides*, Elw. and Edw. ["Biarritz, July 25th, in the Basses-Pyrenees."]  
(a) race *pseudomalvae*, Vrty.—I. gen. *pseudomalvae*, Vrty., *Soc. Ent. It.*, 1913, p. 212 ("Florence"); II. gen. *malvoides*, Elw. and Edw.—P.It., up to 1200m.
- Powellia sao*, Hb. ["Germany, in various regions."]  
(a) race *sao*, Hb.—I. gen. *sao*, Hb.; II. gen. presumably *parvula*, Vrty., *E.R.*, 1921, p. 173. ["Atzwang, in S. Tyrol."]—Calabrian Coast Range, 800m.
- (b) race *gracilis*, Vrty.—I. gen. *subgracilis*, Vrty., *E.R.*, 1921, p. 173 ("Florence"); II. gen. *gracilis*, Vrty., *E.R.*, 1919, p. 28 ("Florence").—C.It., up to 1200m.

Subfamily: Pamphilinae.

Tribe: Cyclopidi.

*Heteropterus morpheus*, Pall. ["Russia."]

- (a) race *morpheus*, Pall.—Monterotondo (Romè), m. 165, and Atina (Caserta), m. 500.

(To be continued.)

Tribe: *Pamphilidi*.

*Adopaea lineola*, O. ["Several parts of Germany."]

(a) race *clara*, Tutt, *B.B.*, 1905, p. 96.—P.It., up to 1200m.

*Adopaea flava*, Brünn. ["Denmark."]

(a) race *iberica*, Tutt, *B.B.*, 1905, p. 107 ["Spain and S. France"].—P.It., up to 1200m.

*Thymelicus acteon*, Rott. ["Landsberg-on-the-Warthe, in Prussia."]

(a) race *acteon*, Rott.—P.It., up to 1200m.

(b) race *ragusai*, Vrtý., *E.R.*, 1919, p. 28 ["Palermo, in Sicily"].—Calabrian Coast Range, 700 to 800m.

*Urbicola comma*, L. ["Sweden."]

(a) race *apennina*, Rost., *Soc. Zool. It.*, 1911, p. 72 ["Vallerotonda, m. 500, in the Prov. of Caserta"].—C.It., up to 1300m., in dry localities.

(b) race *alpina*, Bath, *Entom.*, 1896, p. 21 ["on the Wengern, Scheideck Pass, at 6000 ft., in the Bernese Alps"].—C.It., at high altitudes, from 1100 to 1300 m. (Sibillini Mts.).

*Angiades sylvanus*, Esp. ["France."]

(a) race *sylvanus*, Esp.—I. gen. *sylvanus*, Esp.; II. gen. *minuta*, Vrtý., *Lab. Zool. Portici*, 1920, p. 44 ["Tuscany"]; III. extraord. gen. *sylvanellus*, Trti., *Soc. Sc. Nat.*, 1914, p. 603 ["Formia, 50m., in the Prov. of Caserta"].—P.It., up to 1200m.

*Gegenes nostradamus*, F. ["Barbaria."]

(a) race *nostradamus*, F.—Rome, 50m., according to Rostagno, from specimens in his collection, named genitally by Reverdin; Solfatare, near Naples, according to Oberthür.

*Gegenes lefebvrii*, Rbr. ["Andalusia."]

(a) race *lefebvrii*, Rbr.—C.It., up to 500m.

*Note*.—Ragusa maintains most positively that in Sicily this species has two generations, so that it may be the same occurs in Peninsular Italy, although we have had no opportunity to ascertain it (see *Ent. Rec.*, xxxi., p. 106).

Superfamily: *Rhopalocera*.

Division: *Lycaenida*.

Family: *Lycaenidae*.

Subfamily: *Lycaeninae*.

Tribe: *Chrysophanidi*.

*Heodes virgaureae*, L. ["Sweden."]

(a) race *apennina*, Calb., *Iris*, 1887, p. 125.—C.It., from 900 to 1500m. ("Gran Sasso, in the Abruzzi, and Boscolungo in the Tuscan Apennines, at 1300 m.")

*Thersamonia thersamon*, Esp. ["Sarepta, in S. Russia".]

(a) race *thersamon*, Esp.—I gen., according to Calberla, *thersamon*, Esp.; II. gen. *thersamon*, Esp.—Rome, 50m.; Frattocchie, m. 189, near lake of Albano.

*Note*.—In the specimens I have before me of the II. generation from the Frattocchie a few males have short tails, but they are not as long and thin as in my Syrian examples; most of them have none. I think, on the whole, one cannot apply here the name of *omphale*, Klug, to this generation. All the authors I have consulted mention no other character for *omphale* but its long tails. (R. Verity.)

*Chrysophanus dispar*, Hw. ["Cambridgeshire, in England."]

- (a) race *rutilus*, Wernb.—I. gen. (presumably, but still unknown) *vernalis*, Horm., *Soc. Ent.*, viii., p. 130 (1893) ["Roumania"]; II. gen. *rutilus*, Wernb., *Btr.*, i., p. 391 (1864) ["Northern and Southern Germany (also Sweden)"].—Coast marshes of C.It.

*Chrysophanus hippothoë*, L. ["Sweden"].

- (a) race *italica*, Calb., *Iris*, 1887, p. 126.—C.It., 1300 to 1600 m. ("Gran Sasso, at 1500m., in the Abruzzi").

*Rumicia phlaeas*, L. ["Westmannia, in Sweden."]

- (a) race *initia-caudata*, Tutt.—I. gen. *phlaeas*, L.; II. gen. *initia-caudata*, Tutt., *B.B.*, 1896, p. 374 ["Britain"]; III. gen. *initia*, Tutt., *B.B.*, 1896, p. 374 ["Britain"].—C.It., 1000 to 1400m., in dry localities.

- (b) race *eleus*, F.—I. gen. *phlaeas*, L.; II. gen. *eleus*, F., *Suppl. E.S.*, p. 430 ["Germany"]; III. gen. *initia-caudata*, Tutt.—C.It., 1000 to 1400m., in damp localities.

- (c) race *nigrioreleus*, Vrtv.—I. gen. *phlaeas*, L.; II. gen. *nigrioreleus*, Vrtv., *E.R.*, 1920, p. 6 ("Florence"); III. gen. *eleus*, F.; IV. extraord. gen. *initia-caudata*, Tutt.—P.It., up to 1000m.

- (d) race *aestivus*, Z.—I. gen. *phlaeas*, L.; II. gen. *aestivus*, Z., *Isis*, 1847, p. 39 ["Etna, in Sicily"]; III. gen. *eleus*, F.—Isle of Elba, up to 500m., and probably southern Calabria.

*Loweia alciphron*, Rott. [Type: Hüfnagel's description: "Berlin."]

- (a) race *romanorum*, Frühst., *Inter. Ent. Zeit.*, 1909, p. 112 ("Rome").—The most widespread race of C.It., from 600 to 1200m.

*Note*.—An extensive series collected in the Sibillini Mts. in 1922 exhibits considerable variation in both sexes; the darkest males are similar to the "types" of *ruehli* in the Turati collection, the lightest recall *gordius*, Sulz., of southern France, on upperside.

- (b) race *ruehli*, Trti., *Societas entom.*, 1911, p. 83.—("Cerchio and Celano, in the Abruzzi.")

- (c) race *mirabilis*, Vrtv., *E.R.*, 1919, p. 28.—("Mt. Senario, near Florence, 700 to 800m.")

- (d) race *calabra*, Vrtv., *Boll. S. Ent. It.*, 1914, p. 229, t. I., f. 43.—("Aspromonte, 1200m., in Calabria.")

*Loweia dorilis*, Hüfn. ["Berlin."]

- (a) race *italorum*, Vrtv.—I. gen. *italorum*, Vrtv., *E.R.*, 1919, p. 29 ("Florence"); II. gen. *italorum*, Vrtv.; III. gen. *italorum*, Vrtv.—P.It., up to 1200m.

Tribe: *Lycaenidi*.

Group: *Scolitantidi*.

*Scolitantides baton*, Bgstr. ["Hanau, in Germany."]

- (a) race *baton*, Bgstr.—I. gen. *baton*, Bgstr., mixed with the early form *praecocior*, Vrtv., *E.R.*, 1919, p. 29 ("Florence"); II. gen. *baton*, Bgstr., mixed with the late form *obscurata*, Vrtv., *E.R.*, 1919, p. 29 ("Florence").—P.It., up to 1400m.

Group: *Lycaenidi*.

*Lycaena arion*, L. ["Europe." Type: figure of Roesel, *Insecten*, suppl., Pl. 45, f. 3-4: "Germany."]

(a) race *punctifera*, Grund, *Int. Ent. Zeit.*, 1908, p. 87 ["Dalmatia"].  
—C.It., up to 1400m.

*Note.*—Some individuals point distinctly to the culminating race *ligurica*, Wagner, *Soc. Ent.*, 1904, p. 1, described from "Bordighera to S. Remo."

*Lycaena arcas*, Rott. ["Frankfurt-on-the-Mayn, in Germany."]

(a) race *arcas*, Rott.—Cisterns of Mt. Cairo, 1700m., near Cassino (Caserta), found by Querci, and Gran Sasso d'Italia, in the Abruzzi, according to Standfuss.

*Note.*—We only give the name of the race tentatively, because the species was found by Querci many years ago and the specimens sent to Otto Staudinger, who named the species, but made no remarks as to their being different from the German examples.

*Lycaena euphemus*, Hüb. ["Saxony, in Germany."]

(a) race *peninsulae*, mihi.—"Sibillini Mts., in the Marche, below Bolognola, at 1000m."

*Note.*—Mann's locality of Leghorn is certainly a blunder; Standfuss's Abruzzi needed confirmation, because, to my knowledge, no actual specimen from central Italy was in existence in collections; Calberla had not found it; Curò gives Liguria, but on what authority he does not state. The discovery made by Querci of a female of *euphemus* on June 26th, 1922, thus adds a species to this region. By its small size (28mm. of expanse) and washed out tone of colour it resembles some of my Geneva specimens, which I take to be *paula*, Schultz, but none of these are as pale and dull, nor are they so extensively covered by grey scales, which reduce the blue ones to a light powdering, mixed with the grey, in basal half of wings. The central row of spots are blackish on all the wings. The premarginal spots of hindwings are grey and all stand out in broad white circles, the marginal black band being quite abolished. The underside is of a pale grey, colder in tinge than in any other specimen I have seen, and a white streak runs down the middle of each internervural space, as in *albobuneata*, Spüler; all the marginal and premarginal spots are small, but perceptible also on forewing. All these features, no doubt, are not racial, but one can infer from this individual that the race is small and pale and probably overshadowed with dark scaling above and of a light grey on underside. There is a possibility that this be a very abnormal *alcon*, but the amount of blue and the broad white premarginal spaces of upperside makes it very unlikely. (R. Verity.)

*Lycaena alcon*, Schiff. ["Vienna."]

(a) race *italica*, Trti., *Atti Soc. It. Scienze Nat.*, 1919, p. 168.—("Mt. Cimone, in Northern Tuscany, at 1000m.") on the boundary of Peninsular Italy. Specimens in the Verity coll. presented by Turati.

*Note.*—The name of *italica* was unfortunately preoccupied in this tribe for a race of *P. tithonus*; if it be considered necessary to alter it, I suggest that of *turati*ana. (R. Verity.)

*Glaucopsyche cyllarus*, Rott. ["Germany."]

(a) race *pauper*, Vrtý., *E.R.*, 1919, p. 29 ("Florence").—P.It., up to 1400.

#### Group: *Plebeidi*.

*Cyaniris semiargus*, Rott. [Type: description of Geoffroy, *Hist. Abr. Ins.*, II., p. 63, No. 31: "Paris."]

- (a) race *ausonidarum*, Vrty., *E.R.*, 1919, p. 45.—“Aurunci Mts. (Caserta), 600m.”
- (b) race *cimon*, Lewin, *Ins. Gr. Brit.*, I., p. 80, t. XXXVIII., f. 6-7 [“Bath, in England”].—P.It., up to 700m.
- (c) race *porrecta*, Vrty., *E.R.*, 1919, p. 45.—C.It., 1200 to 1700m. (Apuane Alps and “Abetone Pass, in Northern Tuscany”; Sibillini Mts. in the Marche.)
- (d) race *quercii*, Vrty., *E.R.*, 1919, p. 45.—“Aspromonte, 1200m., in Calabria.”

*Aricia medon*, Hüfn. [“Berlin.”] = *astrarche*, Bgstr. [“Hanau.”]

- (a) race *aestiva*, Stgr.—I. gen. *agestis*, Schiff., *S.W.*, p. 184 (1776) [“Vienna”]; II. gen. *aestiva*, Stgr., *Cat.*, ed. II., p. 11 (1871) [“Greece”].—C.It., in alpine surroundings (Sibillini Mts., 1200m.).
- (b) race *gallica*, Obthr.—I. gen. *subornata*, Vrty., *E.R.*, 1920, p. 148 (“Florence, 200m.”); II. gen. *gallica*, Obthr., *Ét. Léop. Comp.*, IV., p. 252, and X., f. 2374 [“Cancalle and Morbihan, in France”]; III. gen. *gallica*, Obthr.—Pratofiorito Mt., 1300m., in Northern Tuscany.
- (c) race *subcalida*, Vrty.—I. gen. *subornata*, Vrty.; II. gen. *subcalida*, Vrty., *E.R.*, 1920, p. 150 (“Valley of the Fegana and of the Camaione, 350 to 550m., near Lucca”); III. gen. *subcalida*, Vrty.—P.It., up to 550m.
- (d) race *calida*, Bell.—I. gen. *ornata*, Stgr., *Iris*, 1892, p. 280 [“Tunis, in N. Africa”]; II. gen. *calida*, Bell., *Soc. Ent. France*, 1862, p. 615, t. 14, f. 6 [“Corsica”]; III. gen. *calida*, Bell.—Isle of Elba, up to 500m.
- (e) race *pallidefulva*, Vrty.—I. gen. *subornata*, Vrty.; II. gen. *pallidefulva*, Vrty., *E.R.*, 1920, p. 149 (“Florence”); III. gen. *pallidefulva*, Vrty.—C.It., in very dry surroundings, 200 to 1200m. (“Pian di Mugnone, 200m., near Florence”; Camaione valley, near Lucca, and on the Apuane Alps in the exceptionally hot and dry summer of 1920.)

*Aricia chiron*, Rott. [“Landsberg-on-the-Warte, in Germany.”]

= *eumedon*, Esp. [“Frankonia, in Germany.”]

- (a) race *chiron*, Rott.—Southern Italy (Aurunci Mts. (Caserta), 700m.; Aspromonte, 1200m., in Calabria).

*Plebeius argus*, L. [“Sweden.”]

- (a) race *philonomus*, Bgstr., *Nov. Insekt.*, II., p. 73, pl. XLIV., f. 7-8 (1779) [“Hanau, in Germany”]. = *aegidion*, Meiss. [“high alps (Ursenthal, Grimsel)”]. = *alpina*, Berce., = *valmasinii*, Perlini [“Valtellina”].—Apuane Alps, in N.W. Tuscany (Mt. Matanna, m. 1300).
- (b) race *lunensis*, Vrty., *E.R.*, 1919, p. 45.—“Pertusola, near Spezia,” on sea shore.
- (c) race *italorum*, Vrty., *E.R.*, 1919, p. 45.—“Abetone Pass, 1300m., in Northern Tuscany,” and Mainarde Mts. (Caserta), 500m.
- (d) race *apenninica*, Vrty., *E.R.*, 1919, p. 45.—“Pratofiorito Mt., 1000m., near Lucca,” and Sibillini Mts., 1200m., in the Marche.
- (e) race *tuscanica*, Vrty., *E.R.*, 1919, p. 45.—C.It., in lowlands up to 700m. (“Baths of Casciana, near Pisa”).

- (f) race *calabrica*, Trti., *Societas entom.*, XXV., p. 84 (Jan., 1911) (= *calabrica*, Vrty.).—Calabria, 600 to 1000m. (“S. Fili, 800m., on the Calabrian Coast Range.”)

*Plebeius insularis* (Leech), Obthr. [“Hakodate, in Japan.”] = specifically, *ligurica*, Obthr. [“Cassarate (Lugano) and Cernobbio (Como).”]

- (a) race *latialis*, Rost., *Soc. Zool. It.*, 1911, p. 50 (= *mira*, Vrty., *Bull. Soc. Ent. Ital.*, XLV., p. 2:30 [1914]: “Florence”).—C.It., up to 500m. (Co-types in Verity coll. from “Monte Cavo, near Rome”).

- (b) race *calabricola*, Vrty., *E.R.*, 1921, p. 175.—“Calabrian Coast Range, 800m.”

*Note.*—These *Plebeius* species seem doomed to confusion in their nomenclature and to synonymy! Among the latest names there is the case of *ligurica*, published at the same time by Courvoisier and by Oberthür. Now I discover that the same thing has happened with the very interesting little race of Central Europe. My name of *aegusella* was published in the *Ent. Rec.* for October, 1921, and in that very month Stauder was writing a somewhat more lengthy description of it, which was published in the *Entomologischen Anzeiger*, Jahrgang II., Nr. 10-11, issued, I presume, very soon after that date, although no date is mentioned on the extract I have of it. He names that race *Lycaena difficilis*, considering it a distinct species, “intermediate between *argyrognomon* and *ligurica*.” As I possess specimens transitional to *aegus*, Chapm. (see *Ent. Rec.*, l.c., p. 176), I do not think this view can be correct. (R. Verity.)

\* *Plebeius idas*, L. [Type: description in *Fauna Suecica*, 1075, of blue female supported by one of the oldest (unset) specimens in the Linnæan collection:—“Sweden.”] (= *argyrognomon*, Bgstr.: [“Hanau”].)

- (a) race *abetonica*, Vrty., *Boll. Soc. Ent. It.*, 1912, p. 273.—“Abetone Pass, 1300m., in Northern Tuscany.”

*Note.*—Quite distinct from *argellus*, Trti. [“Salsomaggiore (Parma),” (*Societas Entomol.*, XXVI., p. 67)], of which I have seen the types in the Turati collection; the latter is smaller, frailer, of a pale, washed-out colour on both surfaces; females on underside of an extremely pale *café-au-lait* colour; blue dusting of upperside much less pronounced than in *abetonica* and never reaching beyond basal half of wing. This weakly form may be expected to be found also in Peninsular Italy, in parched localities and during August. (R. Verity.)

- (b) race *apenninophila*, Vrty., *E.R.*, 1919, p. 46.—C.It., in deep mountain valleys (“Fegana Valley, 500m., near Lucca,” and Mollarino valley, 500m., in the Prov. of Caserta).

- (c) race *australissima*, Vrty., *E.R.*, 1919, p. 46.—(“Forte dei Marmi, on coast of Tuscany.”)—C.It., up to 500m. (Atina in Mainarde Mts.).

\* Referring to the name *idas*, L., as used by the author above, it is necessary to explain that Dr. Verity means thereby *argus*, L. = *argyrognomon*, Bergstr. The Rev. Geo. Wheeler has shown quite conclusively that the name *idas* was given by Linné to the female of his *argus*. It is therefore a “nomen nudum.” It seems necessary to make the above explanation, as scarcely any British entomologist would know to what species Dr. Verity was referring.—Eds.

*Note.*—*Plebeius insularis* and *P. idas* have two emergences: end of May to beginning of June and end of July to September in lowlands; beginning of July and middle of August at high altitudes. These emergences do not seem to be true generations, but a "bipartite emergence," with an interval, which varies in length according to climate.

*Polyommatus tithonus*, Hb. ["No text."] = *eros*, O. ["Tyrol and Swiss Alps."]

- (a) race *italica*, Obth., *Ét. Lép. Comp.*, IV., p. 232.—C.It., in alpine surroundings, 1200m. ("Majella Mt., in the Abruzzi," and Sibillini Mts. in the Marche).

*Polyommatus icarus*, Rott. ["Landsberg-on-the-Warte, in Germany."]

- (a) race *zelleri*, Vrty.—I. gen. *zelleri*, Vrty., *E.R.*, 1919, p. 44 ("Florence") (= *meridionalis*, Tutt, *nomen praeocc.*); II. gen. *aestivalis*, Tutt, *B.B.*, 1910, p. 123 ("Southern Europe").—P.It., up to 1300m.

*Polyommatus meleager*, Esp. ["Saxony, in Germany."]

- (a) race *macra*, Vrty., *E.R.*, 1920, p. 144.—C.It., 500 to 1000m. ("Pratofiorito Mt., 1000m., near Lucca"), and Mollarino valley, 500m. (Caserta).

- (b) race *squalida*, Vrty., *E.R.*, 1920, p. 145.—C.It., in alpine surroundings ("Sibillini Mts., 1200m., in the Marche").

*Note.*—This is a very distinct race: out of a dozen females collected in 1922 only one exhibited any trace of blue: the others were entirely white and grey; the males are still smaller and paler than those of race *macra*.

*Hirsutina dolus*, Hb. ["No text."]

- (a) race *virgilia*, Obth., *Ét. Lép. Comp.*, iv., p. 263.—C.It., in alpine surroundings ("Sulmona, 500m., in the Abruzzi"; Sibillini Mts., 1200m., in the Marche).

*Hirsutina damon*, Schiff. ["Vienna."]

- (a) race *ausonia*, Vrty., *Boll. Soc. Ent. It.*, 1913, p. 232, f. 46-47.—C.It., at high altitudes ("Sibillini Mts., 1200m.").

*Agriades thesites* (Cant.), Chapman. ["France."]

- (a) race *meridiana*, Vrty.—I. gen. *hibernata*, Vrty., *E.R.*, 1919, p. 43; II. gen. *meridiana*, Vrty., *E.R.*, 1919, p. 44.—P.It., up to 1200m. ("Florence, 200m.").

*Agriades amandus*, Schn. ["Sweden."]

- (a) race *isia*, Frühst., *Soc. Ent.*, 1910, p. 47 ["Moulinet, in Provence"], (= *splendida*, Rost., *Boll. Soc. Zool. It.*, 1911, p. 53: "Valle Fioio, in the Abruzzi").—C.It., from 400 to 700m.

- (b) race *apenninogenita*, Vrty., *E.R.*, 1921, p. 190.—C.It., in alpine surroundings ("Costarotara, in the Sibillini Mts., 1700m.").

- (c) race *bruttia*, Vrty., *E.R.*, 1921, p. 190.—"Calabrian Coast Range, 900m."

*Agriades hylas*, Esp. ["Saxony, in Germany."]

- (a) race *golgus*, Hb.—I. gen. *correpta*, Vrty., *E.R.*, 1920, p. 144 ("Sibillini Mts., at 1300m."); II. gen. *golgus*, Hb.; *S.E.*, f. 688-689 (1808-1816) ["Spain"].—C.It., usually at 700 to 1300m., but two specimens were found at Formia (Caserta), at sea level.

*Agriades escheri*, Hb. ["No text."]

- (a) race *splendens*, Stef., *Boll. Soc. Ent. It.*, 1904, p. 11.—Northern Tuscany, up to 600m. ("Florence").
- (b) race *altivolans*, Vrty., *E.R.*, 1920, p. 144.—C.It., 500 to 900m. in cold localities ("Firenzuola, 500m., in the Prov. of Florence").

*Agriades thetis*, Rott. (= *bellargus*, Rott.) ["Landsberg-on-the-Warte, in Germany."]

- (a) race *etrusca*, Vrty.—I. gen. *maja*, Vrty., *E.R.*, 1919, p. 29; II. gen. *etrusca*, Vrty., *E.R.*, 1919, p. 29.—C.It., up to 700m. ("Florence").
- (b) race *apenninigena*, Vrty.—I. gen. *apenninigena*, Vrty., *E.R.*, 1919, p. 29; II. gen. *etrusca*, Vrty., *E.R.*, 1919, p. 29.—C.It., 700 to 1200m. ("Sibillini Mts.").

*Agriades hispana* (H.S.), Vrty. ["Spain," as inferred by name, but no text to H.S.'s figure.] (= *aragonensis*, Vrty.)

- (a) race *florentina*, Vrty.—I. gen. *florentina*, Vrty., *Annales Soc. Ent. France*, 1916, p. 517; II. gen. *altera*, Vrty., *l.c.*, p. 517.—Northern Tuscany ("Florence," Leghorn), up to 600m.

*Note*.—Northwards, along the Tuscan and then the Ligurian coast, race *florentina* gradually changes aspect and turns into the perfectly distinct race *vezniceki*, Bartel (*Ent. Zeit. Guben*, 1904, p. 117), described from Rapallo and distributed all along the Riviera. I described its second generation in the *Bull. Soc. ent. France*, but I used for it the same name as for that of race *florentina*, which I now think was quite wrong, considering they differ from each other: the Ligurian one is larger, less pale on both surfaces and with bolder markings equally on both surfaces; for it I suggest the name of **septembris**, mihi, taking as "types" my series collected by Rocci at Quezzi, near Genoa. (R. Verity.)

*Agriades coridon*, Poda. ["Gratz, in Styria."]

- (a) race *apennina*, Z., *Isis*, 1847, p. 148 ("Mts. above Foligno, in Umbria").—Northern part of C.It., 500 to 1000m.—Mt. Fanna, near Florence, and Palazzuolo di Romagna.
- (b) race *sibyllina*, Vrty., *Boll. Soc. Ent. It.*, 1914, p. 133.—"Sibillini Mts., 1200m., in the Marche," and Mainarde Mts. (Caserta), 500 to 1000m.
- (c) race *apuana*, Vrty., *Boll. Soc. Ent. It.*, 1914, p. 131.—"Apuane Alps, in Tuscany, 1000 to 1300m."
- (d) race *superapennina*, Vrty., *Boll. Soc. Ent. It.*, 1914, p. 131.—C.It., 500 to 1000m. ("Pratofiorito Mt.," and Fegana Valley, near Lucca; Abetone, Vallombrosa and Giogo Pass, in the Prov. of Florence).

Group: *Celastrinidi*.

*Celastrina argiolus*, L. ["Type: Raio, *Hist. Ins.*, sect., p. 132, No. 16: "Enfield, in England."]

- (a) race *calidogenita*, Vrty.—I. gen. *calidogenita*, Vrty., *E.R.*, 1919, p. 46 ("Florence"); II. gen. *canicularis*, Vrty., *E.R.*, 1919, p. 47 ("Florence"); III. gen. *canicularis*, Vrty. (perhaps bipartite II. gen. only).—P.It., up to 1300m.

Group: *Jolanidi*.*Jolana jolas*, O. ["Hungary."]

- (a) race *jolas*, O.—Santuario della Civita, 800m., in the Prov. of Caserta, and Fonte Tempesta, near Genzano (Rome).

Group: *Everidi*.*Cupido minimus*, Fuessl. ["Switzerland."]

- (a) race *minimus*, Fuessl.—P.It., up to 1800m.

*Note*.—In very hot and dry localities one meets occasionally with individuals similar to *trinacria*, Vrty., described from Palermo in Sicily, where it prevails.

- (b) race *alsoides*, Boisd., *Gen. et. Ind. Méth.*, p. 12 (1840) ["Valais, in Switzerland"].—C.It., locally, but chiefly in mountains.

*Cupido sebrus*, B. ["Saint Maxim, in Provence."]

- (a) race *sebrus*, B.—C.It., up to 500m.

- (b) race *angulosa*, Vrty., *E.R.*, 1919, p. 47.—C.It., 500 to 1600m. ("Firenzuola, 500m., in Tuscany," and Sibillini Mts. in the Marche.)

*Note*.—We do not mention any second generation of either *Cupido*, even as partial, because it seems much more likely that the very rare individuals of both species one meets with in August are tardy ones, which emerge after the "summer pause," and not offsprings of the spring generation.

*Everes alectas* (Hoffmannsegg, in Hübner), Chapman. ["Austria."]

- (a) race *diminuta*, Vrty.—I. gen. *diminuta*, Vrty., *E.R.*, 1919, p. 47 ("Florence"); II. gen. *alectas*, Hoffmannsegg.—C.It., up to 1200m.

*Everes argiades*, Pall. ["Russia."]

- (a) race *argiades*, Pall.—I. gen. (never seen by us); II. gen. *argiades*, Pall.—Siena, Rome and Atina (Caserta), up to 500m., in C.It. Very local as compared with the preceding.

Group: *Lampididi*.*Raywardia telicanus*, Lang. ["Southern France."]

- (a) race *telicanus*, Lang.—I. gen. *telicanus*, Lang; II. gen. *telicanus*, Lang.—C.It., up to 1800m.

*Note*.—In 1919 (*E.R.*, xxxi., p. 148) we considered this species as an annual, with an emergence of early sporadic individuals all through the summer, but in 1921 such a considerable number were collected near Florence in May, that it seems highly probable a partial extraordinary I. gen. may exist. One cannot of course make sure of it till it is shown that its offsprings grow up in time to emerge in the same year, joining the primary September emergence. In Egypt two broods are recorded.

*Lampides boeticus*, L. ["Habitat in Barbaria" = Alger.]

- (a) race *boeticus*, L.—P.It., up to 1800m.

Tribe: *Theclidi*.Group: *Callophryidi*.*Callophrys rubi*, L. ["Sweden."]

- (a) race *virgatus*, Vrty., *Linn. Soc. Journ. Zool.*, 1913, p. 187 ("Florence").—P.It., up to 1000m.

Group: *Theclidi*.

*Strymon (Edwardisia) w-album*, Knoch. ["Leipzig, in Germany."]

(a) race *w-album*, Knoch.—C.It., up to 500m.

*Strymon (Nordmannia) ilicis*, Esp. ["France."]

(a) race *ilicis*, Esp.—Aspromonte, 1000m., in Calabria.

(b) race *inornata*, Vrty., *Boll. Soc. Ent. It.*, 1911, p. 278; 1913, p. 228, t. I. ("Florence").—P.It., up to 1200m.

*Strymon (Nordmannia) acaciae*, F. ["Southern Russia."]

(a) race *italica*, Vrty., *E.R.*, 1919, p. 48 ("Florence").—C.It., up to 1200m.

*Strymon (Klugia) spini*, Schiff. ["Vienna."]

(a) race *major*, Rühl, *Gross-Schmetz.*, p. 180 (1895) [no locality] = *Obthr., Ét. Lép. Comp.*, iv., p. 69 (1910) ["Alpes Maritimes"].—Mainarde Mts., 500m.; Valle del Petrella, m. 1200, in Aurunci Mts.

(b) race *minuta*, Vrty., *E.R.*, 1919, p. 48.—"Sibillini Mts.," 1200m.

*Note.*—This species is recorded from the Abruzzi by Calberla and Rostagno, but we do not know which of these two very distinct races it produces there. Stauder records it from the Aspromonte, in southern Calabria, under the name of *modesta*, Schultz, but this is certainly a misuse of this name. As to the name of *major*, we find Rühl's description and our specimens from the Maritime Alps both agree perfectly with those collected by Querci in the Mainarde and Aurunci Mts.

Group: *Ruralidi*.

*Ruralis (Bithys) quercus*, L. [Type: not Petiver's figure, which does not correspond to Linneus' colour description of "*caeruleis*"; consequently Linneus' second quotation becomes typical: Raio, *Hist. Insect.*, p. 129, n. 8: presumably "England."]

(a) race *interjecta*, Vrty., *E.R.*, 1919, p. 48 ("Florence").—C.It., up to 1300m.

*Ruralis betulae*, L. ["Sweden."]

(a) race *betulae*, L.—C.It., up to 900m. (Baths of Lucca, Giogoli, m. 400, near Florence, and Palazzuolo di Romagna in Tuscany; Oricola in the Abruzzi). Very local and scarce.

*NOTE TO GENUS LYCAENA.*—All doubt concerning the existence of *L. euphemus* in the Sibillini Mts. has been removed by the capture of several specimens last July.—R.V.

Family: *Erycinidae*.

Subfamily: *Nemeobiinae*.

*Nemeobius lucina*, L. ["Habitat in Europa," type; Petiver's figure: "Cambridge and London."]

(a) race *lucina*, L.—C.It., from 500 to 1000m., in the colder and damper mountain localities (Mt. Falterona and Mainarde Mts.). Very local.

(b) race *praestans*; *mihi*.—C.It., in warm and dry lowland localities ("Upper Vingone Valley, near Florence"). Very local.

*Note.*—The latter race is distinctly larger (26 to 30mm. as compared to 23 to 26mm. of expanse), and is of a much brighter, more saturated and

warmer reddish fulvous than the former, but the extent of this colour is not greater than in average nymotypical *lucina*. On the other hand the very dark form *primipara*, Costantini (*Atti Soc. Nat. Modena*, 1916, p. 15) ["Modena"], which is not unfrequent in Northern Italy and Central Europe, rarely occurs in this region. Rocci has named *fulvior* (*Mem. Soc. Ent. Ital.*, 1923, p. 6) the form standing opposite to it by the extent of fulvous and holds that the name should be applied to the entire race of the "Genoese Apennines," and especially to the second generation he has found there. In Central Italy Querci and I have never met with two generations, so that if *praestans* produces a second one, it may turn out to be *fulvior*, probably of large size and of a warm tone. The first generation of Geneva is a highly characterised *fulvior* of medium size and of a tone intermediate between *lucina* and *praestans*; so is the one of Waidbruck in S. Tyrol. A series from Belstead Wood, near Ipswich, is markedly *fulvior* and warm in tone, but of the smaller (23mm.) nymotypical *lucina* size. I think it will be convenient to introduce the name **parvifulvior** for it. (R. Verity.)

Division: *Papilionida*.

Family: *Pieridae*.

Tribe: *Gonepterygidi*.

*Gonepteryx rhamni*, L. ["Sweden."]

(a) race *rhamni*, L.—C.It., in cold localities (Sibillini Mts., 1300m.).

(b) race *transiens*, Vrtv.—I. gen. *secunda*, Vrtv., *E.R.*, 1919, p. 48 ("Florence"); II. gen. *transiens*, Vrtv., *Linn. Soc. Journ. Zool.*, 1913, p. 180 ("Florence").—C.It., up to 1300m.

*Gonepteryx cleopatra*, L. ["Barbaria." = Alger.]

*Note*.—I have been able to ascertain that this species has three flight-periods, like the following one, so that it seems about certain it has a second generation in August and September, although some individuals of the first generation of June may aestivate and then hibernate in company with those of the second. (R. Verity.)

(a) race *europaeus*, Vrtv.—I gen. *secunda*, Vrtv., *E.R.*, 1919, p. 49 ("Florence"); II. gen. *europaeus*, Vrtv., *Linn. Soc. Journ. Zool.*, 1913, p. 180 ("Florence").—P.It., usually at low altitudes, but occasionally up to 1000m. (Vallombrosa, near Florence).

*Note*.—This year I have had a positive proof that *cleopatra* has at least two generations: one emergence in June and another in August and September. In my garden in Florence I found during July a large number of ova and some young larvae. These grew up rapidly and were on the wing at the beginning of August, together with others, which were seen at large. The *Gonepteryx* would thus behave in the same way as *Polygonia c-album* and *P. egea*. There still remains, however, the possibility that the very fresh-looking individuals of the early spring flight-period are another generation and not hibernated imagos or tardy chrysalids of the preceding year. For the present I consider all the spring individuals as being the same as the late summer ones, so that the racial name I have given to the former must apply to the latter, and the name of *tertia*, Vrtv., becomes a synonym of it, whereas that of *secunda* holds good for the June generation. (R. Verity.)

Tribe: *Coliadi*.

*Colias hyale*, L. ["Habitat in Europa, Africa"; type: not Petiver's figure, which does not correspond to Linneus' colour description of "*flavus*," nor to Roesel's, for the same reason, because both these authors figure *C. croceus*; consequently Linneus's third quotation becomes typical: Raio, *Hist. insect.*, p. 112, n. 6: "Bocking, in Essex, and Canterbury."]

(a) race *calida*, Vrty.—I. gen. *vernalis*, Vrty., *Rhop. Pal.*, p. 222, t. XLVII, f. 32 (November 1908) ["Poltawa, in Southern Russia"]; II. gen. *calida*, Vrty., *E.R.*, 1916, p. 99 ("Florence"); III. gen. *calida*, Vrty.; IV. extraord. gen. *hyale*, L.—C.It., up to 1800m.

*Colias croceus*, Fourcroy. ["Paris."] (= *edusa*, F.)

(a) race *croceus*, Fourcroy.—I. gen. *vernalis*, Vrty., *Rhop. Pal.*, p. 268, t. XLVI, f. 35, and t. XLVII, f. 4-7 ("Florence") (= *mediterranea*, Stauder ["Dalmatia and Triest"]); II. gen. *ampla*, Vrty., *E.R.*, 1919, p. 87 and 121 ["Palermo, in Sicily"]; III. gen. *croceus*, Fourcroy; IV. gen. *vernalis-ampla-croceus*, Vrty.-Fourcr., or *autumnalis*, Rocci, *Soc. Ligust. Sc. Nat.*, 1920, p. 18 ["Genoa"].—P.It., up to 1800 m.

Note.—On the coast Verity has observed at Forte dei Marmi that emergence and features of second generation differ from those of the hinterland in this species, as in some other *Pieridae*. It appears on the wing later, in the last days of June, and goes on emerging in gradually increasing numbers all through the summer, till the primary emergence of September, so that there is no interval between II. and III. gen. and one can only presume they overlap some time in August. Their aspect gives one no clue, because they are quite alike, form *ampla* not prevailing in the least in II. gen., as it usually does. Many individuals of this species must have an annual life-cycle.

Tribe: *Leptosiidi*.

*Leptosia sinapis*, L. ["Sweden."]

(a) race *bivittata*, Vrty.—I. gen. *lathyri*, Hb., *E.S.*, f. 717-798; II. gen. *bivittata*, Vrty., *E.R.*, 1916, p. 98 ("Poggio Conca, 400 m."); III. gen. *transiens*, Vrty., *E.R.*, 1916, p. 98 ["New Forest, in England"].—C.It.; in damp localities (Poggio Conca, 400 m., near Florence; Poggio, m. 500, in the Isle of Elba).

(b) race *diniensis*, B.—I. gen. *cana*, Vrty., *E.R.*, 1922, p. 92 ("Florence"); II. gen. *diniensis*, B., *Gen. et Index Meth.*, p. 6 (1840) ["Digne, in France"]; III. gen. *diniensis*, B.—C.It., up to 1300 m. (Forte dei Marmi, Mainarde Mts. and Sibillini Mts.)

(c) race *magna*, Vrty.—I. gen. *lathyri*, Hb.; II. gen. *magna*, Vrty., *E.R.*, 1922, p. 91 ["Baths of Valdieri, m. 1375, in Maritime Alps"]; III. gen. *diniensis*, B.—Calabrian Coast Range, 700 m.

(d) race *grandis*, Vrty.—I. gen. *cana*, Vrty.; II. gen. *grandis*, Vrty., *E.R.*, 1922, p. 91; III. gen. *diniensis*, B.—"Pian di Mugnone, 200 m., near Florence."

- (e) race *nigrescens*, Vrtý.—I. gen. *nigrescens*, Vrtý., *E.R.*, 1919, p. 87; II. and III. gen. unknown.—“Marina di Pisa,” in the marshes on coast.
- (f) race *stabiærum*, Stauder.—I. gen. *stabiærum*, Stauder, *Zeit. wissensch. Insekt.*, 1914, p. 371, pl. II., f. 5-6; II. and III. gen. unknown.—“Chestnut woods on the Faito and S. Angelo Mts., m. 700 to 1400, in the prov. of Naples,” according to Stauder.

Tribe: *Anthocharidi*.

*Anthocharis cardamines*, L. [“Sweden.”]

- (a) race *meridionalis*, Vrtý., *Rhop. Pal.*, p. 190, t. XXXVIII., f. 10 (“Florence”).—C.It., up to 1300 m.
- (b) race *turritiferens*, mihi.—Calabria, as far north as Coast Range, up to 1000 m.; also in C. Italy locally in very dry and hot spots, such as the little Sambre Valley, near Florence.

*Note*.—The name of *turritis* was given by Ochseneheimer to one specimen from “Italy” in the coll. of Abate Mazzola of Vienna; it is simply described as having the orange patch only reaching as far as the discocellular lunule. As this character is met with as an individual variation in nearly all races and it is particularly frequent in Italy amongst the *meridionalis*, Ochseneheimer's name should be used to designate that character alone, in whatever race it is met with, as an individual form. The race of the extreme south of Europe, of Asia Minor, etc., to which the name of *turritis*, O., has been applied by Staudinger and others, but which exhibits other characteristics, besides constantly showing the one described by Ochseneheimer, should, it seems to me, receive another name based also on the following features: smaller size, more rounded and shorter wings, paler and more yellowish orange patch, very bright green underside pattern, mixed with yellow abundantly and limited to irregular transverse streaks separated by broad white spaces. I propose the name of *TURRITIFERENS*, taking the specimens of Palermo (Sicily) in my collection as typical. (R. Verity.)

*Anthocharis euphenoides*, Stgr. [“Southern France.”]

- (a) race *euphenoides*, Stgr., *Stett. ent. Zeit.*, 1869, p. 92.—C.It., very locally (specimens in Turati's collection collected by Krüger on May 25th on the Mt. Autore, at 1300 m., in the Abruzzi; collected by Luigioni at Marino, 350 m., near Rome).

*Anthocharis damone*, B. [“Sicily.”]

- (a) race *damone*, Boisd., *Spec. Gen.*, I., p. 564. (1836).—San Luca on Aspromonte in Calabria, according to Turati.

*Euchloë ausonia*, Hb. [“Italy.”]

- (a) race *romana*, Calb.—I. emergence *romana*, Calb., *Iris*, I., p. 123, “Tivoli, 232 m., near Rome”; II. emergence *romanoides*, Vrtý., *Rhop. Pal.*, p. 177, t. XXXVI., f. 35-37 (“Florence”); III. extraord. autumnal emergence *romana*, Calb., and *romanoides*, Vrtý.—P.It., up to 1000 m. Near Paola, in Calabria, Stauder has found this race, as his figures prove.
- (b) race *romana-romanoides*, Calb.-Vrtý.—Single emergence *romana-romanoides*, Calb.-Vrtý.—C.It., locally (“Montenegro, 300 m., near Leghorn”).

(c) race *kruegeri*, Trti.—I. emergence *kruegeri*, Trti.: *Naturalista siciliano*, 1905, p. 29, pl. III., f. 1-6 ["Palermo, Ficuzza, Etna, in Sicily"]; II. emergence *trinacriæ*, Trti., *l.c.*, p. 31, pl. IV., f. 3-6 ["Busambra and Madonie Mts., in Sicily"].—Monte Alto on the Aspromonte in southern Calabria, according to Turati, *Nat. Sic.*, 1919 (publ. December, 1920), p. 14 of extract.

*Note*.—I have pointed out in the *Ent. Rec.*, 1919, p. 143, that the two generations all authors talk of with such assurance are a myth; when they seem to exist, it is a case of "bipartite emergence." In Oberthür's *Ént. Lép. Comp.*, XVII., p. 48 (1920), G. Catherine confirms my views by a discussion of the facts observed by him at Dosches (Aube). In Liguria, there is, according to Rocci, a gradual transition from the distinctly western race found at St. Remo to race *romana* of Central Italy. He has named the first emergence form of the intermediate race from Genoa *genuensis* and the second emergence form *maritima* (*Atti. Soc. Ligustica Sc. Nat.*, XXX., n. 4 (1920)). See my paper on the nomenclature of this species in *Ent. Rec.*, 1923, p. 169. (R. Verity.)

#### Tribe: *Pieridi*.

*Pontia daplidice*, L. ["type: figure of Petiver: 'Cambridge, in England'; habitat 'Southern Europe and Africa'"].

(a) race *daplidice*, L.—I. gen. *bellidice*, *C.I.*, 2, p. 154 (1808) ["Leipzig in Germany"]—or *zellerica*, mihi; II. gen. *expansa*, Vrtv., *E.R.*, 1919, p. 87, "Florence"; III. gen. *subalbidice*, Vrtv.; IV. gen. *daplidice*, L.; V. extraord. gen. *octobris*, mihi.—P.It. up to 1000m.

*Note*.—On the Tuscan coast, at Forte dei Marmi, I have discovered this year the existence of an unsuspected generation, which emerges in the first half of August. A few specimens of the same sort had been collected in Florence and other localities, but they were so scarce we had taken them to be early or late individuals of the other generations. It produces gigantic *expansa* at the end of June. The III. gen. of August is, on the contrary, distinctly smaller than the nymotypical *daplidice* of the IV. gen. of September; in this respect, and by other characters, it resembles the African *albidice*, Obth., very much, so that I propose calling it *SUBALBIDICE*, mihi. The abdomen is very white, the black basal suffusion is quite obliterated on wings, the pattern very reduced on both surfaces; the green one of underside is very yellow, pale, and often indistinct. Form *nitida*, Vrtv., *Rhop. Pal.*, p. 132, pl. XXX., fig. 9, is prevalent in the male sex and frequent in the female. I have found two yellow females of form *flavescens*, Obth. It has thus become clear that European series, in which *nitida* and *albidice*-like specimens prevail, are simply this August generation, and not a local race, as I still thought in *Ent. Rec.*, 1922, p. 126. We have detected the existence of the fifth extraordinary generation of *daplidice*. Contrary to my statement in Vol. XXXIV., p. 126, that 1921 did not produce any; a fresh lot of specimens, which had not been set and examined at that time, has revealed that there was an abundant emergence from the 7th of October in the Pian di Mugnone, near Florence. Its aspect differs slightly, but clearly and

very constantly, from that of the fourth generation (middle of September) in that the underside pattern of the hindwings is more extensive, reducing considerably the white spaces, and is of a bright bluish green, sometimes slightly powdered with black scales, and with no trace of yellow in it or on the nervures. This carries out exactly my prevision that, if the fifth generation did exist, it could not exhibit the features of Rostagno's *zapellonii*, but it must in some way approach the spring form. I must note the fact that Zeller, in *Isis*. 1847, p. 226, points out differences between nymtypical *bellidice*, O., of Germany and the spring generation of Messina, in Sicily, which he names *messanensis*. I lack the necessary materials to verify his statement, but anyhow this name cannot stand, because he had already used it for a totally different form (*P. rapae*, L.) of a near ally. I think it should be replaced by that of *zellerica*, mihi, which suits also the form of Peninsular Italy. The names of *syracusana*, *messania*, and *neapolitana* of that author, applied to summer forms, are based on such subtle and very variable characters in the extent of the underside pattern that I feel unequal to follow him and to make use of them. (R. Verity.)

*Pieris napi*, L. ["Sweden."]

- (a) race *meridionalis*, Rühl.—I. gen. *vulgaris*, Vrty., *Linn. Soc. Journ. Zool.*, 1913, p. 177 ("Florence"); II. gen. *meridionalis*, Rühl., *Pal. Gross-schmett.*, p. 714 (1895) ("Central Italy"); III. gen. *tenuemaculosa*, Vrty., *E.R.* 1922, p. 123.—"Florence, and Atina in Mainarde Mts."—Florence and Atina.
- (b) race *micromeridionalis*, Vrty.—I. gen. *vulgaris*, Vrty.; II. gen. *micromeridionalis*, Vrty., *E.R.*, 1922, p. 138.—Vallombrosa, m. 300; Pitiglio, m. 700 (Pistoia); Prato Fiorito, m. 300 (Lucca); Bolognola, m. 1200, in Sibillini Mts. (Piceno). III. gen. doubtful.
- (c) race *umoris*, Vrty.—I. gen. *umoris*, Vrty., *E.R.*, 1921, p. 210, "Marshes on Tuscan coast at Forte dei Marmi"; II. gen. *micromeridionalis*, Vrty.; III. gen. *micromeridionalis*, Vrty.

*Pieris ergane*, H.-G. ["Dalmatia."]

- (a) race *ergane*, H.-G.—I. gen. *semimaculata*, Rost., *Soc. Zool. It.*, 1906, p. 6 ("Oricola in the Abruzzi") (= *italica*, Trti.); II. gen. *ergane*, H.-G.; III. gen. *rostagni*, Trti., *Nat. Sic.*, 1907, p. 20 ("Oricola in the Abruzzi").—Very local in C.It. from the sea to 800m. (Formia, 50m., Aurunci Mts., 600m., and Atina, 500m., in the Prov. of Caserta; Oricola, 800m., in the Abruzzi; Sefro, 500m., in the Marche.
- (b) race *exigua*, mihi.—I. gen. *semimaculata*, Rost.; II. gen. *ergane*, H.-G.; III. gen. *exigua*, Vrty.—"Upper Fargno Valley, at 1400m., in the Sibillini Mts."

*Note.*—In 1922 Querci has discovered the species at this unusually high altitude; notwithstanding, he found it produces its three generations there, as lower down: I. at end of May: II. at end of June and beginning of July: III. in second half of August. The first and second exhibit no special features, except that the latter does not seem to produce any individuals with very large spots. The third is very striking, on the contrary, from its minute size (29mm. to 32mm. of expanse, so that it is not larger than an average *Polygonmatius icarus*) and much less

than Costa's figure of *minor*; the dark spots are remarkably pale, and often so faint as to be scarcely visible and partly obliterated; the dark suffusion at the base on the upperside, and the dark scaling of the underside of the hindwings are, on the contrary, rather more accentuated than in other races. (R. Verity.)

*Pieris mammi*, (Mayer) Trti. ["Barren mountains near Spalato," in Dalmatia.]

(a) race *rossii*, Stef.—I. gen. *farpa*, Frühst., *Ent. Zeit.*, 1909, p. 41 ("Tivoli, 232m., near Rome"); II. gen. *secundogenita*, mihi; III. gen. *rossii*, Stef., *Soc. Ent. It.*, 1900, p. 178 ("Fiesole, 300m., near Florence"); IV. gen. *septembrina*, mihi; V. extraord. gen. *quercii*, Rost., *Soc. Zool. It.*, 1911, p. 64 ("Formia, 50m., in the Prov. of Caserta").—P.It., up to 1200m.

(b) race *montana*, Vrty., *Rhop. Pal.*, p. 158, t. XXXIV., f. 28 (1908) ("Vallombrosa, 1000m., in Tuscany").—C.It., in high mountains. Described from II. gen.; I. gen. unknown.

*Note.*—Stefanelli's name of *rossii* must apply to the third generation, which in Florence emerges in "July and the beginning of August," and the existence of which I have this year found out, as perfectly distinct from the second of June and the fourth of September. I will deal with this subject more at length in my paper on "Seasonal Polymorphism, etc.," but, as these generations must be set down correctly in this List, I am obliged to name them and describe them briefly here. The II. gen. *SECUNDOGENITA*, mihi, is extremely variable in size, both individually and locally; in some localities (Forte dei Marmi) many individuals (35% in my typical series) are not larger than spring *farpa*; in others ("Mt. Fanna, at 600m.," and Isle of Elba) the giant form *creta*, Vrty., *E.R.*, 1919, p. 88, prevails largely, and constitutes a race. Abdomen never as white, and black basal suffusion of wings above never entirely obliterated, as it often is in III. gen. *rossii*. Black markings never as deep in tone and often quite gray; their outlines are irregular and shaded; the apical patch rather crescentic than triangular and deeply indented in female; central spots of this sex never distinctly quadrate; streaks, connecting them to outer margin in *rossii*, never present or only represented by a light gray shading. Underside of hindwings always pale yellow or whitish, with an extensive, but sparse, black scaling, never entirely absent, as in many *rossii*. In the Isle of Elba the II. gen. consists of *rossii*, perfectly similar to those of the III. gen. On coast, at Forte dei Marmi, this species is extremely abundant all through the summer; the II. gen. from end of June to most of July, the III. during the whole of August. The IV. gen. emerges both there and in Florence from about September 10th to the end of the month. I thus name it *SEPTEMBRINA*, mihi. Its features consist in a combination of the very dark and sharp black markings of *rossii* with the following characters of the spring *farpa*; small size; black shading at base of wings in both sexes; spots on underside of forewing rather faint; hindwing whitish or pale yellow with quite a considerable amount of dark scaling. My typical series is from the Pian di Mugnone; there the III. g. is nearly suppressed by the drought, but it is less scarce on the Fiesole Hill, above, whence Steffanelli described *rossii*. (R. Verity.)

*Pieris rapae*, L. ["Sweden."]

(a) race *secunda*, Vrtý.—I. gen. *verna*, Zeller, *Isis*, 1847, p. 221 ["Messina, in Sicily"]; II. gen. *secunda*, Vrtý., *Soc. Ent. Ital.*, 1916, p. 180 ("Isle of Elba"); III. gen. *tertia*, Vrtý *l.c.*, p. 180 (Isle of Elba); IV. gen. *rapae*, L.; V. extraord. gen. *ultima*, Rocci., *Soc. Ligustica Sc. Nat.*, 1919, p. 24 ("Genoa").—P.It., up to 1300m.

(b) race *syracusana*, Zeller.—I. gen. *verna*, Zeller; II. gen. *syracusana*, Zeller, *Isis*, 1847, p. 221 ["Syracuse, in Sicily"]; III. gen. *messanensis*, Zeller, *l.c.*, ["Messina, in Sicily"]; IV. and V. extraord. gen. unknown.—Calabria. The specimens described by Stauder from Paola (*Zeit. wissenschaft. Insektenb.*, 1914, p. 369) and from 300m. to 1800m., on the Aspromonte (*l.c.*, 1916, p. 14) agree perfectly with this Sicilian race.

*Note*.—In my paper on "Seasonal polymorphism, etc.," I will point out that the first generation of *rapae* of Southern Europe differs markedly from that of the north, chiefly on account of the large percentage of individuals belonging to form *leucotera*, Stefanelli, *Catalogo Illustrativo di Lepidotteri Toscani*, p. 12 (1869) ("Florence") and transitional ones, and that the name of *metra*, Steph., created for the English race, cannot be applied to it. That is why I revive the name of Zeller, which has actually been neglected, with several others, even by his own countrymen, for three-quarters of a century. As a name of a race it luckily cannot be used, because the allied species, *brassicæ*, has the priority in Zeller's paper. This allows one to use the names of the second generation, which best characterise the two races mentioned above. The specific name, of course, must apply to the northern European race. As to the name of *messanensis*, it might be discussed whether it really should be used for the third generation of *syracusana*, July and August being the time of capture given by Zeller, and specimens of *P. mami* being included amongst the "types," as I have pointed out in *Rhop. Pal.*, p. 334, but on the whole I think it may stand for it. The name of *aestiva*, Zeller, *l.c.*, which in its author's mind included both summer generations, but which the existence of *syracusana* restricted necessarily to the third generation, cannot be used for the latter, because it is preoccupied in *brassicæ* for the second generation, and it cannot stand with different meanings in two nearly co-generic species. (R. Verity.)

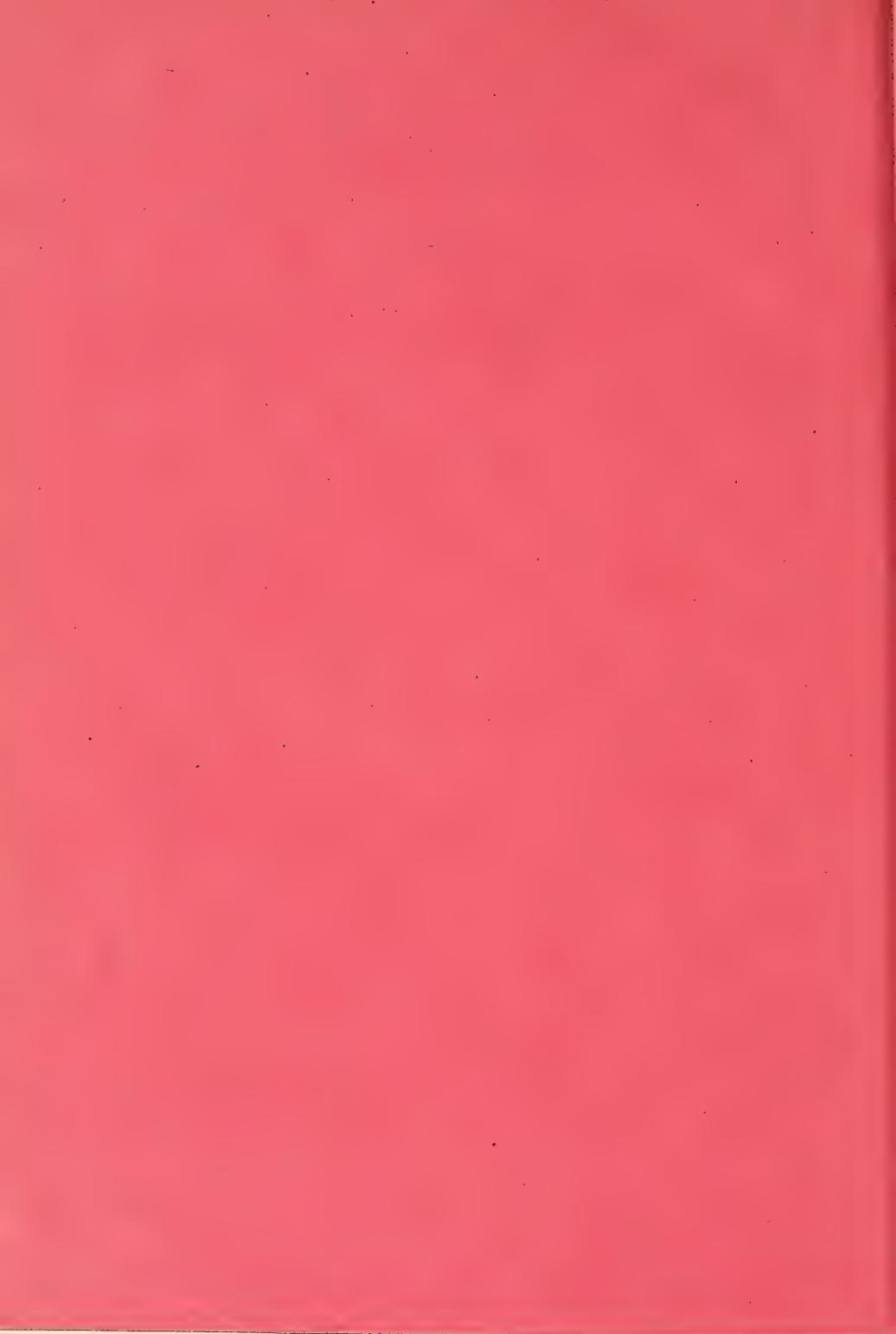
*Mancipium brassicæ*, L. ["Sweden."]

(a) race *brassicæ*, L.—I. gen. *chariclea*, Steph., *Brit. Ent.*, p. 17, pl. III., f. 1-2 ["England"]; II. gen. *brassicæ*, L. = *lepidii*, Röber, *Seitz Macrolepid.*, I., p. 45 (1907) [no locality]; III. gen. *brassicæ*, L., or *tertia*, Vrtý., *E.R.*, 1919, p. 88 ("Florence").—P.It., from 1000m. to 1300m.

(b) race *verna*, Zeller.—I. gen. *verna*, Zeller, *Isis*, 1847, p. 222 ["Messina, in Sicily"]; II. gen. *aestiva*, Zeller, *l.c.* ["Syracuse, in Sicily"] = *catoleuca*, Röber., *Ent. Nachr.*, 1896, p. 81 ["Taurus and Syria"]; III. gen. *brassicæ*, L., or *tertia*, Vrtý.; IV. extraord. gen. *autumnalis*, Rocci., *Soc. Ligustica Sc. Nat.*, 1919, p. 19 ("Genoa").—P.It., up to 1000m.

*Note*.—The remarks I have made in *rapae* concerning the first generation can be repeated here. In the south of Europe it differs





**List of the Macro-lepidoptera, including the Pyrales, Crambi and Pterophorina of Hampshire and the Isle of Wight.**

Compiled by W. FASSNIDGE, M.A., 1923,

FOR

The Entomological Society of Hampshire and the Isle of Wight.

FOREWORD.

In offering to its members and to the Entomological public a county list of Lepidoptera, the Entomological Society of Hampshire and the Isle of Wight hopes to supply a long-felt want. In the first place, there is no other list in existence which has any claim to be complete or up-to-date. The list given in the *Victoria County History* published in 1900, is admittedly most incomplete, incorporating as it does, the records of only a few of the large number of workers who have explored this favoured county. The list compiled in 1887 and following years by the Rev. A. C. Hervey, and published in the *Proceedings of the Hampshire Field Club*, suffers from the same defect, besides being now woefully out-of-date. Neither of these lists makes any attempt to show the distribution throughout the county, and neither has very much to say on the question of comparative abundance.

In a work of this nature, errors must inevitably occur, and neither of the lists quoted is free from them, nor is immunity claimed for the present list. It is hoped, however, that the care expended has reduced their number to the absolute minimum, and that any discovered will be notified at once for correction in subsequent publications. It is felt too, that there must be many entomologists whose help was not available because their names were unknown to any of our members. To all such the Society appeals for help to make this list more complete, for there yet remain parts of Hampshire of whose entomological fauna we know little, or nothing.

Our grateful thanks are due to all our members for their invaluable help; to all others who have kindly sent data; to Mrs. K. B. Robertson of Chandler's Ford, for permission to use the notes of the late Major Robertson, and to Mr. H. J. Turner for help and advice on a multitude of questions.—W.F.

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## ABBREVIATIONS.

gen. dist. = generally distributed.	sc. = scarce.
c. ev. = common everywhere.	v. r. = very rare.
n. c. = not common.	1 sp. = single specimen.
f. c. = fairly common.	occ. = occasional (ly).
loc. c. = locally common.	abt. = abundant.

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Entomologist's Record.	= E.R.
Entomologist.	= Ent.
Butterflies of the British Isles, by R. South.	= B.B.I.
Moths of the British Isles, by R. South.	= M.B.I.

For the sake of convenience the County has been divided roughly into seven parts, and localities are given so far as possible in the order indicated by the division, viz. :—

1. *New Forest* ... Lyndhurst, Brockenhurst, Ringwood, Beaulieu.
2. *West of N.F.* ... Christchurch, Fordingbridge.
3. *Centre* ... Southampton, Winchester, Bishop's Waltham.
4. *S.E.* ... Portsmouth, Hayling Island, Portsdown Hills.
5. *East* ... Forest of Bere, Ditcham, Hyden Wood, Woolmer Forest.
6. *North* ... Alton, Andover, Basingstoke, Aldershot, Harewood Forest, Pamber Forest.
7. *Isle of Wight*.

The following abbreviated forms of place-names are used throughout:—

New Forest. = N.F.	Winchester. = Winton.
Lyndhurst. = Ly.	Chandler's Ford. = Ch. Fd.
Brockenhurst. = Brockt.	Portsmouth. = Ptsmth.
Bournemouth. = Bnmth.	Isle of Wight. = I.W.
Christchurch. = Christch.	Ventnor. = Vent.
Fordingbridge. = Fdge.	Freshwater. = Freshw.
Southampton. = Soton.	

## RHOPALOCERA.

*Papilio machaon*.—Single sp. have occurred, possibly escapes or attempts to introduce; "Formerly," H.F.C.; 1 sp. seen Bnmth., 1900, R.; 2 sp. seen Ventnor, no doubt escapes, C.; Appears formerly to have been indigenous to I.W., 1 sp. Parkhurst, 1900, 1 sp. west of same, 1902, I.W.G.

*Aporia crataegi*.—Now extinct in the county, formerly abt. though loc. in N.F., last sp. about 1883, V.; Otterbourne woods, July, 1872, W.L., 1875.; Used to be c. nr. Havant, Rev. A. J. Richards; Reported seen at Bonchurch about 20 yrs. ago, C.; Possibly now extinct, I.W., the few captures all in wood nr. Ryde, I.W.G.

*Pieris brassicae*.—c. ev.

*P. rapae*.—c. ev.; Occ. var. *nigropunctata* (2nd brood ♀) Havant, E.

*P. napi*.—c. ev.

*Pontia daplidice*.—Occ. sp. have been taken, probably all immigrants; Ly., 1879, Hk.; Highcliffe, 1 sp. Aug., 1900, D.; Hayling, 3 sp. taken, many others seen, Aug., 1859, Rev. A. J. Richards; Seen at Silchester, J. Cooper, teste H.

*Euchloë cardamines*.—c. ev. most yrs.; N.F., not c. but well dist., J.; Not gen. dist., Aldershot, Sn.

*Leptosia sinapis*.—N.F., formerly abt. loc., rare since 1883, V.; Does not now occur in N.F., J., Ht.; Rare and loc. Hursley, M.; Crab Wood and Silkstead, v. r., none lately, W.L., 1891; 1 sp. seen Hyden Wood, May, 1913, B.; Hambledon, H.F.C.; Formerly f. c. Basingstoke, D., A., T.; Plentiful in some woods in N. especially nr. Basingstoke, V; A small colony nr. Basingstoke, 1920, Col. Welsh-Thornton., Hk.; Woolmer, loc. and r., E.; Formerly abt., Pamber, rarely seen for many yrs., T., H.; I.W., No recent record, I.W.G.; "I believe it to be rare," C.

*Colias hyale*.—Occ. immigrant sp. from all parts; 1892, 1900, and 1911 the best of recent yrs.; Never plentiful and most yrs. absent; N.F., Always found in migrant yrs., avoids uncultivated parts, J.; I.W., Vent., "I believe light forms of *croceus* are often recorded as *hyale*," C.

*Colias croceus (edusa)*.—Much more plentiful than *C. hyale* and recorded from all parts; Abt. some yrs. rarely entirely absent; var. *helice* occurs with the type; 1892, 1900, 1903, 1917, 1920 and 1922 were good years; I.W., Vent., var. *helice* and light forms nearly as c. as the type, C.

*Gonepteryx rhamni*.—c. usually almost ev.; N.F., sc. 1921, D.; Portsdown, f. c., Occ. sp. at Fareham, T.; Sc. in 1921 at Alton, S.

*Apatura iris*.—Recorded from large oak woods in all parts, more or less scarce; N.F., sc., D., M. etc.; Southern and eastern parts of N.F., V.; f. c. in N.F. before 1920, bad weather the sole cause of present scarcity, J.; "Have never seen it near Ringwood," N.; Fdge., formerly, no recent record, Ct.; Bnmth, 1 sp. *Ent.*, 1916, 214; Chilworth, 1 sp. seen, F.; Bassett, r., A.; Ch. Fd., 1 sp. seen, R.; occ., A.; Hiltingbury Woods, 1 sp. seen, K.; Romsey, 1 larva, Pe.; Crab Wood, rare, 3 larvae, 1918, Sweeting; 1 ♀ caught by a lad in the village street at Owslebury, 1919, P.; Seen several times in Sheepwash Woods, B.; Reported f. c. in Alice Holt, S.; Oak woods round Alton and Basingstoke, V.; Occ. abt. Basingstoke district, Sherborne woods and Pamber, seen in some numbers, 1918, 1919, none 1920, one 1921,

has been taken in plenty in Doles Wood and Harewood, H.: Marghclere, seen most years, Sl.; I.W., v. r., 1 sp. Parkhurst, 1890, 1 sp. seen Parkhurst three or four yrs. later, I.W.G.; Reported from Parkhurst, "but I have grave doubts," C.

*Limenitis sibylla*.—Loc. c. in all larger oak woods; Single sp. seen even in town streets; ab. *nigrina* and intermediate forms occur with the type; I.W., not c. Parkhurst and Sandown woods, C.; Parkhurst, c., Quarr Copse, Whitefield Woods, etc., I.W.G.

*Polygonia c-album*.—N.F., Old records, no specified locality, J.; 1 sp. Brockt., Aug., 1922, Bond; Winton, W.L., 1871; Owslebury, several sp. 1919, none since, P.; Formerly at Worldham, H.F.C.; I.W., v. sc., I.W.G.

*Eugonia polychloros*.—Gen. dist., n. c.; N.F., f. c., D., M., J., etc.; *Aglais urticae*.—c. nearly ev.; Soton, n. c., F.; Aldershot, r. Sn.

*Vanessa io*.—c. ev. most yrs.

*Euvanessa antiopa*.—Occ. sp. from all parts, chiefly nr. coast.

*Pyrameis cardui*.—c. some yrs. ev.; More c. in Spring than Autumn at Ptsmth., B.; Seen at Vent., early March, "am convinced it hibernates here," C.

*Pyrameis atalanta*.—c. ev., sometimes abt.; 1 sp. found in a hollow tree in Dec., Vent., C.

*Dryas paphia*.—More or less c. in woods ev.; I.W., n. c., C.

var. *valesina*.—N.F., c., B., M., T., etc.; "seems unaffected by collecting or bad weather," J.; Soton, r., F.; Eastleigh, f. c., K.; Ch. Fd., r., R.; Owslebury, r., P.; Ampfield, r., Ht.; Seen in Alice Holt, S.; In some plenty some yrs. at Pamber, H.; Andover, Sl.; I.W., Parkhurst, I.W.G.

*Argynnis cydippe (adippe)*.—Loc. c. in all larger woods; N.F., Quite unaffected by weather, abt. every yr., J.; Ch. Fd., sc., R.; Alton district, n. c., S.; I.W., Scattered, always sc., C.

*Argynnis aglaja*.—Loc. and n. c.; all large woods and downs; N.F., Well dist., J.; Ptsmth, loc. and confined to certain woods, B.; Harewood, v. c., H.; I.W., Often v. c. on downs, C.; Loc. and not particularly c., I.W.G; ab. *charlotta* has been taken in N.F.

*Issoria lathonia*.—Occ. sp. chiefly nr. coast; Highcliff, six sp. seen, four taken, 1899, D.; 1 sp. reported seen 1922 nr. Mudiford, Dt.; Nr. Horndean, Rev. A. J. Richards; Pamber, by H. N. Davies, H.; I.W., occ. sp., I.W.G.

*Brenthis euphrosyne*.—c. ev. in woods; Dark vars. occur with the type; A second brood occurs occ.; Owslebury, one locality on open downs, P.

*Brenthis selene*.—loc. c. ev. in and nr. woods; occ. vars. occur; A second brood occurs fairly often; in 1915, H; in 1921, F.

*Melitaea cinxia*.—Loc. in I.W. only, D., M., T., etc. Common along the coast from Luccombe to Chale, found several miles inland, on St. Boniface Down in fair nos., seems to be holding its own, C.; occ. sp. recorded from other parts of I.W., F.; Has increased considerably since 1909, many new localities have been formed and old ones re-established, I.W.N.H.S.

*Melitaea aurinia*.—N.F., 2 sp. Church Place, 1921, Adamson; 2 sp. 1922, Harris; Several at Royden, 1920-21, odd sp. elsewhere in N.F., several sp. Lady Cross, 1922, possibly put down, J.; Ringwood, N.; Fdge., "formerly, but I have never seen it," Ct.; Fdge., plentiful

in its old locality, 1919-21, N.; moist meadows nr. Fdge., V.; Soton, 1 sp. in a clearing, F.; Lordswood, Mottisfont, formerly, Pe.; Hursley, several sp. in a clearing, M.; Eastleigh, a very strong colony, K.; Swathling, H.F.C.; Owslebury, a few sp. in a clearing, P.; Ch. Fd., 1 sp. only, 1919, R.; Ch. Fd., sparingly, c. some years, has been taken at Winton, Ht.; Woolmer, a strong colony, E.; Pamber, in some plenty, H.; nr. Fleet, V.; Titchfield, Oakhanger, H.F.C.; Sth. of Newbury, Sl.; I.W., "Exists, but I cannot find it," C.; Decidedly r., a few west of Parkhurst, single sp. Gurnard and Newport, I.W.G.

*Anosia archippus (plexippus)*.—Occ. immigrant sp., have been recorded, chiefly nr. coast. 1 sp. Gosport, 1920, teste Ps.; I.W., 1 sp. seen Vent., 1921, C.; 1 sp. on the Culvers, 1908, I.W.G.

*Melanargia galathea*.—Loc. c. throughout; N.F., sc., D.; Colonies in various parts of N.F., H.F.C.; "I know of no loc. in N.F. at present day," J.; Owslebury, n.c., P.; Hayling, 1 sp., probably blown over from I.W., E.

*Satyrus semele*.—c. on downs and heaths. In rides, Hiltingbury woods, K.; Unknown to Owslebury before 1910, now c., downs and woods, P.

*Pararge aegeria*.—N.F., abt., D., J., M., etc.; Christch., Dt.; Fdge., gen. dist., Ct.; Ampfield, r., Ht.; Soton, r., F., A.; Hursley, Stoneham, f. c., M.; Romsey, Pe.; Owslebury, not found, attempt to introduce, 1921, P.; Ptsmth, c., B.; Selborne, f. c., Alice Holt, sc., S.; Rowlands Castle, sc., Woolmer, c. some years, E.; Sth. of Newbury, Sl.; not seen in Hants outside N.F., H.; I.W., decidedly sc., C.; c. in woods and lanes, I.W.G.

*Pararge megera*.—c. ev.; Ch. Fd., sc., R.; Aldershot, 3 broods 1921, Sn.; abt. in Nth. Hants, seldom seen in other parts, H.; I.W., v.c. ev., "I believe we have three broods," C.

*Epinephele jurtina (janira)*.—abt. ev.; I.W., silvery white vars. occ., C.

*Epinephele tithonus*.—v. c. ev.; I.W. ab. *albida* and ab. *minckii*, all shades of colour from white to type., C.

*Aphantopus hyperantus*.—c. ev. in woods; ab. *arete* and ab. *caeca* occur ev. occ. with the type; ab. *lanceolata* v. r.

*Coenonympha pamphilus*.—v. c. ev.

*Ruralis betulae*.—N.F., sc. and v. loc., A., T., J., etc.; Ringwood, N.; Hursley, sc. and loc., M.; Farley Mount, r. and loc., Ht.; Owslebury, sc., P.; Ptsmth, loc. c., B., Ps.; Alton, loc., S.; Hawkley, *Ent.*, 1915, p. 222; Monxton, 1 sp. 1901, 1 sp. between Whitechurch and Kingsclere, 1917, H.; Burghclere, 1 sp., Sl.; Nr. Liss and Thruxton, V.; Colmer, Ropley, H.F.C.; I.W., v. r., C.; Nr. Haven St., I.W.G.

*Bithys quercus*.—Usually c. in all large oak woods. Has been sc. for the last 2 or 3 seasons.

*Strymon w-album*.—Rare in Hants, *B.B.*, p. 146.; Seen nr. Romsey, Pe.; Burghclere, 1 sp., Sl.; Colmer, 2 sp., H.F.C.; I.W., v. r., one locality only, C.

*Callophrys rubi*.—Gen. dist. and c., woods and downs.

*Rumicia phlaeas*.—Abt. ev.; a third brood some yrs.; ab. *sufusa* and ab. *caeruleopunctata* f. c., ab. *cuprina* occ.; Vent., 1 sp. mid-February, C.

*Lampides boeticus*.—Occ. immigrant sp. only, *B.B.*, p. 155; Winton, 3 sp. on Teg Down, 1898, Ht.

*Everes argiades*.—N.F., 1 sp. 1921, *Ent.*, LIV. 269; 1 sp. Bnmth., Rev. O. Pickard-Cambridge, 1885.

*Plebeius aegon*.—Loc. c. on heaths and downs; N.F., 1 sp. 2nd brood Oct. 30, 1921, F.; I.W., f. c. only, C.; uncommon, the only recent record nr. Parkhurst, 1902, I.W.G.

*Aricia medon (astrarche)*.—More or less c. and loc. throughout.

*Polyommatus icarus*.—c. ev.; occ. vars. occur.

*Agriades coridon*.—Loc. c. on all chalk downs; N.F., odd sp. have been recently recorded, possibly escapes, J.; Winton, ab. *albicincta* taken, M.

*Agriades thetis (bellargus)*.—Loc. c., but much more restricted than *A. coridon*; f'dge., c. some yrs., Ct.; Winton, r., Ht.; St. Catherine's Hill, abt., reappeared 1920, Sweeting, F.; Portsdown Hills, loc. c., E., B., T.; Aldershot, v. abt., Sn.; I.W., loc. abt., D., C., Hk.; Vent., c., A.; loc. on the chalk, I.W.G.

*Celastrina argiolus*.—Gen. dist., often c., usually 2 broods. Aldershot, not seen till 1921, n. c., Sn.

*Cupido minimus*.—v. c. on all chalk downs; nr. Christch., Dt.; N.F., a locality nr. Everton on borders, J.; Ringwood, N.; Hinton Admiral, v. c., R.; I.W., c., but v. loc., C., I.W.G.

*Celastrina semiargus*.—"Formerly," H.F.C., *B.B.*, p. 178.

*Lycæna arion*.—Winton, old records, Ht., *B.B.*, p. 181.

*Hamearis lucina*.—Loc. c. in larger woods. f'dge., formerly, "I have never seen it here," Ct.; Fawley Down, abt. miles from any wood, F.; I.W., "Reported from Parkhurst, but I have not seen it in the Island," C.; loc. and n. c., I.W.G.

*Hesperia malvae*.—c. ev.; ab. *taras*, N.F., M.; Ch. Fd., R.

*Nisoniades tages*.—c. ev.; a more or less numerous second brood often occurs.

*Adopæa flava (thaumas)*.—c. ev.

*Adopæa lineola*.—Nr. Bnmth., 1 sp., Pe.; Rumoured to be in N.F. (*E.R.*, I. 131, etc.); Not found in N.F., J.; We would suggest careful and systematic search for this insect, which might easily be overlooked.

*Thymelicus acteon*.—N.F., "One locality known to several entomologists; whether originally put down or not I cannot say," J.; I.W., Sandown, a pair, I.W.N.H.S.

*Urbicola comma*.—Loc. and more or less c. on all chalk downs; N.F., occ. sp., Hk., V., A.; Baddesley, 1 sp., F.; I.W., has been taken, C.

*Agriades sylvanus*.—c. ev.

#### HETEROCERA. (arrangement as in South's *Moths of Br. I.*)

*Mimas tilia*.—Gen. dist. and c.

*Amorpha populi*.—Gen. dist. and c. wherever poplars are found. Ch. Fd., sc., R.; Winton, 1 sp., September, 1921, Sweeting; Ptsmth, pink forms occ., B.

*Smerinthus ocellatus*.—Gen. dist. but n. c., except in N.F.

*Manduca atropos*.—Occ. sp. only from all parts; larvae found less rarely.

*Sphinx convolvuli*.—Occ. sp. from all parts except from the extreme North. Much less rare than *M. atropos*. F. c. some years on and nr. coast, rarely entirely absent. Christch., larvae found, Dt. (*Ent.*, LV. 19).

*Sphinx ligustri*.—Gen. dist. but n. c.

*Hyloicus pinastri*.—Winton, 1 perfect sp. on lamp post in the city, *E.R.*, XIV. 248); Has been recorded from Soton Common, but certainly is not there now, F.

*Hyles euphorbiae*.—Nr. Soton, 1 sp. in a garden, *M.B.*, I. 38, and *Ent.*, 1872; Hayling, 2 larvae taken by Dr. Kelso, B.

*Celerio gallii*.—Recorded for N.F., V.; Lymington, 1 sp. by A. R. D. Patterson, R.; Colmer, H.F.C.; I.W., I sp. 1831, *M.B.*, I. 39; Freshw., 4 larvae and 2 imagines, 1859, I.W.G.

*Phryxus livornica*.—Occ. sp. all along the coast. Ly., 1 sp. 1888, V.; Boscombe, about a dozen, R.; one by a labourer, May 20th, 1904, R.; Christch., observed 1904 and following years, Dt.; Hayling, 1 sp. Dr. Hay; Alverstoke, 1 sp. May 13th, 1922, *E.R.*, XXXIV., 115; I.W., 2 sp. at Brightstone, M.; Vent., v. r., C.; Ryde, 6 larvae, July, 1870, *M.B.*, I. 42; See Tutt, *Brit. Lep.* (IV. 165).

*Hippotion celerio*.—Christch., 1 sp. in the eighties by J. M. Adye, Dt.; I.W., v. r., 5 sp. are recorded by I.W.G.

*Daphnis nerii*.—2 sp. ♂ and ♀ in Ptsmth., 1908, Ps.; Portchester, 1 sp., H.F.C.

*Theretra porcellus*.—N.F., Brockt., sev. sp. in garden, J.; Bassett, A.; Ch. Fd., r., R.; Romsey, Mottisfont, Pe.; Bnmth., r., Ct., Dt.; Winton, loc. and n. c., M., Ht.; Hayling, loc., sometimes c., Dr. Hay, Ps., B.; Portsdown Hill, loc., B.; Alton, S.; Pamber, 4 sp. at flowers, H.; Monxton, 1 sp., H.; I.W., n. c., C.; Fairly plentiful, I.W.G.

*Eumorpha elpenor*.—Widely dist. but n. c.; N.F., c., J., Hk.; Ringwood, N.; Bnmth., Ct., Dt.; Fdge., taken by Dr. Rake, Ct.; Soton, Bassett, occ., M., F.; Eastleigh, r., K.; Marchwood, Hk.; Ch. Fd., sc., R.; Romsey, Mottisfont, Pe.; Winton, occ., Ht.; Hayling, Dr. Hay; Fareham, occ., T.; Alton, occ., S.; larvae c. at Ovington, S.; Nr. Andover, Pamber, 1 sp., H.; I.W., moderately c., I.W.G.

*Macroglossa stellatarum*.—Gen. dist. and loc. abt. some yrs.

*Hemaris fuciformis*.—Gen. dist. and f. c. in all larger woods; I.W., must be v. r., I.W.G.

*Hemaris tityus (bombylifomis)*.—Much more loc. and less c. than *H. fuciformis*. N.F., Ringwood, N.; loc. c., D., M., J.; Soton; larvae abt. 1922, F., B.; Ch. Fd., f. c., R.; Winton, n. c., Ht.; Ptsmth., n. c., B.; Hayling, once, B.; Pamber, f. c., H.; Sth. of Newbury, Sl.; I.W., must be v. r., I.W.G.

*Cerura bicuspis*.—Brockt., 2 larvae, 1922, J.; Ptsmth, v. r., 1 larva, 1921, 2 larvae 1922, B.

*Cerura bifida*.—N. F., Hk., J.; Soton, r., F., A.; Fisher's Pond, r., K.; Ch. Fd., sc., R.; Romsey, Pe.; Winton, f. c., Ht.; Ptsmth., f. c., B.; Bedhampton, c., Ps.; Havant, c., E.; Kingsclere, Sl.; I.W., sc., A.; Rare, I.W.G.

*Cerura furcula*.—Widely dist. throughout but sc.; especially sc. in N. and N.E. I.W., rare, I.W.G.

*Cerura vinula*.—Gen. dist. and f. c.

*Stauropus fagi*.—Gen. dist. but n. c. Larvae on oak, beech, birch. I.W., v. r., West Cowes, I.W.G.

*Drymonia trimacula*.—N.F., occ., M., F.; Ringwood, occ., N.; Ch. Fd., f. c., R.; Ampfield, Ht.; Ptsmth., n. c., B.; Fareham, at light, H.

*Drymonia chaonia*.—N.F., occ., sometimes c., F., M., T., etc.;

Christch., 1 sp., Dt.; Soton, n. c., F.; Ch. Fd., f. c., R.; Ptsmth., n. c., B.; Fareham, at light, H.; I.W., Shanklin, a few, Sandown, occ., East Cowes, I.W.G.

*Pheosia tremula (dictaea)*.—N.F., occ., M.; Ringwood, N.; Christch., Dt.; Soton, r., F.; Romsey, r., A., Pe.; Winton, c., Ht.; Fareham, at light, H., T.; Ptsmth., f. c., B.; I.W., Shanklin, f. c., Sandown, East Cowes, I.W.G.

*Pheosia dictaeoides*.—N.F., occ., Pe., M.; Ringwood, N.; Ly., 1 sp., Ht.; Christch., Dt.; Soton, r., F.; Winton, f. c., Ht.; Ch. Fd., f. c., R.; Ptsmth., n. c., B.; Hayling, 1 sp., Dr. Hay; Pamber, H.; I.W., 1 sp. at Sandown, I.W.G.

*Notodonta zizac*.—N.F., c., M.; Ringwood, N.; Soton, c., F.; Ch. Fd., sc., R.; Romsey, Pe.; Crab Wood, Ht.; Winton, n. c., W.L., 1891; Eastleigh, f. c., C.; Hursley, c., M.; Ptsmth., f. c., B.; Fareham, H.; 1 sp., T.; Alice Holt, c., S.; Pamber, H.; Kingsclere, Sl.; I.W., f. plentiful, I.W.G.

*Notodonta dromedarius*.—N.F., occ., M., Pe., Ht.; Sway, Ct.; Soton, r., F., A.; Romsey, Pe.; Ch. Fd., sc., R.; Winton, r., Ht.; Ptsmth., n. c., B.; Alton, Woolmer, S.; Pamber, H.; I.W., r., Freshw., Sandown, I.W.G.

*Notodonta trepida*.—N.F., occ., M.; sparingly, Ht.; sometimes f. c., F.; Ringwood, loc. c., N.; Ch. Fd., sc., R.; Romsey, Pe.; Ptsmth., n. c., B.; Fareham, H.; Pamber, H.; Kingsclere, Sl.; I.W., East Cowes, several, I.W.G.

*Leucodonta bicoloria*.—Hayling, larvae found on maple and 2 imagines bred, Dr. Hay.

*Lophopteryx cuculla*.—Winton, ought to be on our maple, Ht.; Romsey, r., Pe.; Waterlooville, v. r., B.; Alton, 3 larvae, S.

*Lophopteryx camelina*.—Gen. dist. and c. N.F., occ., M., T., F.; I.W., n. c., I.W.G.

*Odontosia carmelita*.—N.F., has been taken, Ht., M.B., I. 78; Ptsmth, r., Horndean, 1920, B., Ps.

*Ptilophora plumigera*.—Winton, said to occur, Ht.; Ptsmth., r. at light, nr. Horndean, B.; Liss, Petersfield, Ps.; Alton, not unc., S.

*Pterostoma palpina*.—N.F., c., M.; Ringwood, N.; Broekt., Ct.; Christch., Dt.; Soton, f. c., F.; Eastleigh, occ., K.; Romsey, Pe.; Winton, Ht.; Ch. Fd., sc., R.; Ptsmth, n. c., B.; Alton, S.; Monxton, Pamber, H.; Sth. of Newbury, Sl.; I.W., A.; uncommon, I.W.G.

*Phalera bucephala*.—Abt. ev.

*Pygaera curtula*.—N.F., Hk., H.F.C.; *Ent.*, 1917, p. 15; Soton, r., 2 larvae beaten from aspen, F.; Ch. Fd., sc., occ. larvae beaten from aspen, R.; Romsey, Pe.; Winton, has occurred, W.L., 1891; Fareham, Mortimer West End, H.; I.W., Seaview, A.

*Pygaera anachoreta*.—Christch., 1 sp. in garden, probably an escape, R.; Hayling, 1 sp., Dr. Hay.

*Pygaera pigra*.—N.F., H.F.C., A.; Holmsley, a few, R.; Ly., Ht.; Soton, loc., v. c. some yrs., F., A.; Ch. Fd., sc., R.; Ptsmth., loc. c., B.; Nr. Basingstoke, T.; Tadley, H.; Sth. of Newbury, Sl.

*Habrosyne derasa*.—Gen. dist. and c.; Ch. Fd., sc., R.; Alton, 1 sp., S.

*Thyatira batis*.—Gen. dist. and f. c.

*Palimpsestis octogesima*.—Havant, 1 sp., A. H. Sperring; v. r., Ps.; Alton, 1 sp. at sugar, S.

*Palimpsestis or.*—Bassett, n. c., A.; Soton, r., F.; Crab Wood, c. at sugar, Ht.; Winton, occ. at sugar, M.; Harewood, 1 sp., H.; Sth. of Newbury, Sl.

*Palimpsestis duplaris.*—N.F., f. c., T., B.; Woodgreen, Ct.; Bassett, f. c., A.; Soton, se., F.; Ch. Fd., se., R.; Crab Wood, c., Ht.; Ptsmth., n. c., B.; Alton, 1 sp. so far, S.; Pamber, c., H.; Harewood, H.; Sth. of Newbury, Sl.; I.W., f. c., I.W.G.; Freshw., Pe.

*Palimpsestis fluctuosa.*—Ringwood, N.; Colmer, H.F.C.; known to occur in Hants, *M.B.I.*, I., 91.

*Asphalia diluta.*—N.F., c., M., B.; Ringwood, 1 sp., N.; Sway., Ct.; Soton, c., F., A.; Ch. Fd., v. c., R.; Marchwood, Hk.; Crab Wood, c., Ht.; Ptsmth., c., B.; Alton, Alice Holt, S.; Pamber, v. c., Harewood, Doles Wood, c., H.; Sth. of Newbury, Sl.; I.W., f. c., I.W.G.

*Polyploca flavicornis.*—Gen. dist. among birch and f. c. I.W., rare, East Cowes, I.W.G.

*Polyploca ridens.*—N.F., larvae sometimes c., T., M., F., etc.; Ringwood, v. c. 1918, N., Ly., Ht.; Soton, A.; Ch. Fd., r., Pe., R.; Ptsmth, larvae abt. some yrs., B.; Doles Wood, 1 larva 1912, H.; I.W., old records only.

*Orygia gonostigma.*—Fdge., n. c., Ct.; Selborne, r., H.F.C.; Pamber, n. unc., H.

*Orygia antiqua.*—c. ev.

*Dasychira fascelina.*—Occurs, V.; Ringwood, occ., M.; Petersfield, taken by Dr. Buckell's son, Pe.; I.W., old records only.

*Dasychira pudibunda.*—Gen. dist. and c.

*Nygmia phaeorrhoea* (*Euproctis chrysoorrhoea*).—Ringwood, N.; Fdge., n. c., Ct.; Winton, 1 sp. 1889, Ht.; I.W., Vent., C., A.; one nest, 1920, S.; St. Lawrence, f. c., B.; Sandown, A.; sometimes c. nr. Shanklin, and has been taken in many localities, I.W.G.

*Leucoma chrysoorrhoea* (*Porthesia similis*).—c. ev.

*Stilpnotia salicis.*—Bnmth., abt., 1912, Ct.; Christch., R. Dt.; Winton, n. c., Ht.; Ptsmth., f. c., B.; Lee on Solent, Hk.; Fareham, H., T.; Havant, f. c., E.; I.W., Shanklin, Sandown, I.W.G.

*Lymantria dispar.*—Hayling, two males at light, Dr. Hay; Southsea, 1 sp. in shop window, *E.R.*, III. 187; I.W., 1 sp. some yrs. ago, Parkhurst, I.W.G. These sp. were possibly escapes; attempts to introduce the species in the Soton district were unsuccessful.

*Lymantria monacha.*—Gen. dist. and c. in all woods; var. *eremita* occurs occ.

*Malacosoma neustria.*—c. ev.

*Trichiura crataegi.*—N.F., occ., M., Ht.; Ringwood, N.; Soton, n. c., F., A.; Ch. Fd., se., R.; Ptsmth, n. c., B.; Alton, S.; Pamber, c., H.; I.W., 1 sp. at light, E.; Rare, the Undercliff, I.W.G.

*Poecilocampa populi.*—Gen. dist. and f. c.

*Eriogaster lanestris.*—Ringwood, N.; Romsey, Pe.; Winton, f. c., Ht., M., F.; Farley, Hursley and Shawford downs, f. c., R.; Ptsmth, r., B.; Hambledon, se., Ps.; Fareham, occ., T.; Andover, c., H.; Sth. of Newbury, Sl.; I.W., sparingly, I.W.G.

*Lasiocampa quev̄cus.*—Gen. dist. and f. c.

*Lasiocampa trifolii.*—N.F., loc., J.; occ., M.; c., Ht.; One locality, possibly now extinct, A.; *M.B.I.*, I. 121; Christch., larvae reported taken, Dt.; Hayling, one season, Dr. Hay; Hayling, v. loc., 1921,

B., Ps.; Heaths nr. coast, H.F.C.; Heaths nr. Ly., c., V.; Occurs on Hayling I., V.; I.W., rare, Nettlestone, St. Helens, I.W.G.

*Macrothylacia rubi*.—Gen. dist. and abt. on heaths and commons.

*Cosmotriche potatoria*.—Gen. dist. and c. by river sides and in low-lying parts.

*Gastropacha quercifolia*.—Widely dist. but n. c.

*Endromis versicolor*.—1 sp. seen (?) Cranbury Park, 1910 R.; Ch. Fd., 1 sp. seen (?) A.; 1 sp. seen Harewood, 1913, H.; Andover, f. c., Sl.

*Saturnia pavonia*.—N.F., well dist., seldom c., J.; occ., M., T., F., etc.; Bnmth., f. c., Fdge.; n. c., Ct., Dt.; Soton, occ., F.; Eastleigh, occ., K.; Ptsmth., r., B.; Hayling, Dr. Hay; Headley Heath, S.; Tadley and Silchester commons, H.; Aldershot, c., Sn.; I.W., Vent., C.; Downs between Shanklin and Vent., occ., I.W.G.

*Drepana falcataria*.—Gen. dist. among birch but n. c.

*Drepana binaria*.—N.F., occ., M., N.; Fdge., f. c., Ct.; Christch., Dt.; Soton, n. c., F., A.; Ch. Fd., sc., R.; Crab Wood, f. c., Ht.; Hursley, occ., M.; Ptsmth., n. c., B.; Denmead, Sheepwash, f. c., Ps.; Fareham, H.; Harewood, Pamber, H.; I.W., f. c., Shanklin, Ningwood, 1 sp., Sandown, a few, Werrar Wood, Bembridge, Whippingham, I.W.G.

*Drepana cultraria*.—N.F., occ., M., F.; Ringwood, N.; Ch. Fd., sc., R.; Crab Wood, Ht.; Ptsmth., c., B.; Wickham, c., T.; Selborne, abt., S.; Forest of Bere, c., H.; Harewood, H.; Burghclere, Sl.

*Drepana lacertinaria*.—Gen. dist. and c. among birch. I.W., old records only.

*Cilix glaucata*.—Gen. dist. and f. c.

*Nola cucullatella*.—N.F., c., T., B.; Ringwood, N.; Fdge., Ct.; Christch., Dt.; Soton, c., F., A.; Ch. Fd., f. c., R.; Winton, f. c., Ht.; Ditcham, abt., B.; Havant, c., E.; Little Park, Hk.; Alton, S.; Pamber, c., H.; Sth. of Newbury, Sl.; I.W., Binstead, c., M.; Sandown, Bembridge, I.W.G.

*Nola strigula*.—N.F., loc. c., J.; occ., T., M.; c., Ht.; Holmsley, R.; Ch. Fd., sc., R., A.; Soton, sc., F.; Winton, f. c., Ht.; Horndean, n. c., B.; Pamber, occ., H.

*Nola confusalis*.—N.F., c., T., M., Ht., Ringwood, N.; Christch., Dt.; Rasset, f. c., A.; Ch. Fd., sc., R.; Winton, c., Ht.; Horndean, n. c., B.; I.W., Bembridge, 1857, I.W.G.

*Nola albula*.—1 sp. nr. Freshw., V.; this is probably the sp. noted by Barrett from I.W.; Hants., several sp., *Ent.*, 1914, p. 39.

*Nola centonalis*.—A few sp. Bembridge, I.W., V., *M.B.I.*, I. 143.

*Earias chlorana*.—Christch., larvæ beaten from osiers, R., Dt.; I.W., Yarmouth, V.; Sandown, sparingly, I.W.G.

*Hylophila prasinana*.—Gen. dist. and c. in woods.

*Hylophila bicolorana*.—N.F., f. c., B.; Wood Fidle, f. c., M.; Ch. Fd., f. c., R., A.; Soton, r., F.; Ptsmth., n. c., B.; Little Park, Hk.; Harewood, f. c., Pamber, H.; Sth. of Newbury, r., Sl.

*Sarothripa revayana*.—N.F., loc. c. and very variable, J.; c., T., B.; Holmsley, R.; Soton, r., F., A.; Ch. Fd., f. c., R., A.; Ptsmth., loc. n. c., B.; Alice Holt, 1 sp., Hampage Wood, 1 sp., S.; I.W., 1 sp., I.W.G.

*Spilosoma menthastri*.—c. ev.

*Spilosoma urticae*.—Ringwood, N.; Christch., loc. f. c., Dt.; Soton, 2 sp. at light, 1912, Johnson; Winton, by the river, n. c., Ht.; Romsey, loc. f. c., Pe.; I.W., Shanklin, 1 sp., Ent., LII. 138; 1 sp. nr. Sandown, 1902, I.W.G.

*Spilosoma lubricipeda*.—Gen. dist. and usually c. Fareham, usually c.; but none the last 3 yrs., T.; Alton, apparently n. c., S.

*Diaphora mendica*.—Gen. dist. but n. c.

*Phragmatobia fuliginosa*.—Gen. dist. but somewhat sc.; I.W., f. c., I.W.G.

*Parasemia plantaginis*.—Loc. abt. throughout the county on downs and in wood clearings; Soton, n. c., F.; Alton, Alresford, n. c., S.; I.W., Combley, 1 sp., I.W.N.H.S.

*Diacrisia sannio*.—Loc. f. c. on heaths in all parts; I.W., rare, 1 sp. 1907, nr. Osborne, Parkhurst, I.W.G.

*Arctia caia*.—c. nearly ev.; N.F., sc., J.; Soton, n. c., F.; Ch. Fd., n. c., R.; Alton, n. c., S.

*Arctia villica*.—N.F., f. c., J.; Bröckt., occ., T.; Ringwood, N.; Edge., Milton, Hinton Admiral, Ct.; Christch., Dt.; Soton, occ., F., M.; Eastleigh, occ., K.; Ch. Fd., n. c., R.; Romsey, Pe.; Winton, no recent record, Ht.; Portsdown Hills, c., B., H.; Hayling, f. c., E., F.; Fareham, occ., T., H.; I.W., abt., D., K., Hk., I.W.G.

*Callimorpha quadripunctaria*.—I.W., 1 sp. 1877, M.B.I., I., 164.

*Callimorpha dominula*.—Ringwood, N.; Swathling, sc., F.; Eastleigh, Bishopstoke, abt., K.; Romsey, Pe.; Winton, Shawford, abt., M., Ht, F., T., R.; Nursling, c., F., A.; Sth. of Newbury, Sl.

*Coscinia cribrum*.—N.F., Ringwood, T., M., N., etc.; Hinton Admiral, T.; Christch., Dt.; Between Ringwood and Bnmth., Ht.; North Gate, R.; Nr. Bnmth., V.; the Verwood locality is reported utterly destroyed by fire; I.W., Freshw., 1859, I.W.G.

*Deiopeia pulchella*.—Occ. immigrant sp. in favourable yrs., chiefly on and nr. the coast.

*Hipocrita jacobaeae*.—c. ev.

*Atolmis rubricollis*.—N.F., c., J.; occ., T., B., Ringwood, N.; Hurst Hill, c., M.; Christch., Dt.; Soton, f. c., F., A.; Ch. Fd., r., R.; f. c., A.; Crab Wood, Ampfield, n. c., Ht.; Ptsmth., loc. f. c., B.; Sth. of Newbury, Sl.; I.W., Vent., C.; Parkhurst, Hk.; America Woods, East Cowes, I.W.G.

*Nudaria mundana*.—N.F., Beaulieu, H.F.C.; Christch., sc., R.; Edge., n. c., Ct.; Ch. Fd., sc., R.; Winton, f. c., Ht.; Ptsmth., occ., B.; Havant, occ., E.; I.W., Freshw., occ., M.; Underliff, r., Brading Down, n. r., East Cowes, I.W.G.

*Comacla senex*.—N.F., c. in many bogs, V.; Edge., f. c., Ct.; Soton, loc. abt., F.; Ch. Fd., v. abt., R., A.; Winton, c. in water meadows; Ht.; Purbrook, abt., B.; Fareham, occ., T.; Alton, loc. abt., S.; Woolmer, loc. abt., E.; I.W., Carisbrooke, abt., I.W.N.H.S.

*Mitochondria miniata*.—N.F., c., T., F., J.; Ringwood, N.; Edge., sc., Ct.; Christch., Dt.; Soton, sc., F.; Eastleigh, f. c., K.; Romsey, Pe.; Ch. Fd., sc., R., f. c., A.; Ampfield, a few, Ht.; Fareham, H.; Ptsmth., n. c., B.; Harewood, Pamber, H.; Sth. of Newbury, Sl.; I.W., f. c., I.W.G.; Vent., C., A.; Freshw., c., M.

*Endrosa irrorella*.—Winton, Teg Down, Ht.; I.W., Freshw., abt., T., M., S., A.; Vent., M.B.I., I. 178; ab. *signata* occ. taken, I.W.G.

*Cybosia mesomella*.—N.F., c., T., F.; Ringwood, N.; Christch., Dt.;

Soton, c., M.; F.; Ch. Fd., c., R., A.; Winton, n. c., Ht.; Ptsmth., used to be c., now sc., B.; Havant, loc. c., B.; Pamber, c., H.; Sth. of Newbury, Sl.; A yellow form occurs rarely; I.W., Bembridge, Parkhurst, I.W.G.

*Oenestis quadra*.—N.F., occ., T., M., Ht.; Ly., f. c., F.; Holmesley, c., Hk.; Christch., Dt.; Winton, W.L., 1882; Ptsmth., r., B.; Andover, Sl.; I.W., old records only.

*Lithosia deplana*.—N.F., f. c., M., Ht.; Ringwood, N.; Soton, c. some yrs., F., A.; Eastleigh, f. c. and variable, K.; Ptsmth., v. c. some yrs., Ditcham, c., B.; Dark forms occur, f. c.

*Lithosia griseola*.—N.F., Brook, n. c., B.; Ringwood, N.; Fdge., f. c., Ct.; Christch., Dt.; Bassett, A.; Ch. Fd., sc., R.; Winton, f. c., Ht.; Eastleigh, c., K.; Ptsmth., loc. f. c., B.; Havant, occ., E.; Ovington, S.; Longparish, H.; var. *flava* ev. with the type; I.W., Sandown, *E.R.*, VIII. 174; Nr. Yarmouth, Bordwood, I.W.G.

*Lithosia lurideola*.—Gen. dist. and more or less c.

*Lithosia complana*.—N.F., Ht.: Ringwood, N.; Brook, n. c., B.; Fdge., sc.; Hinton Admiral, Ct.; Soton, f. c., F., A.; Ch. Fd., c., R.; Eastleigh, occ., K.; Havant, n. c., E.; Headley Park, 1 sp., S.; I.W., nr. Sandown, I.W.G.

*Lithosia sororcula*.—N.F., loc. r., T., F., B.; Ringwood, N.; Christch., Dt.; Soton, r., F.; Ch. Fd., sc., R.; Ampfield, n. c., Ht.; Hursley, loc., M.; Ptsmth., n. c., B.; Harewood, Pamber, f. c., H.; I.W., Parkhurst, Hk.

*Pelosia muscerda*.—Very occ. sp. recorded from Matley Bog, *E.R.*, V., etc.

*Diptera orion*.—N.F., occ., T., M., Ht.; Hurst Hill, J.; Ringwood, N.; Holmsley, Hk., R.; Soton, sc., F.; Ch. Fd., sc., R.; f. c., A.; Ptsmth., f. c., B.; Forest of Bere, in some plenty, H.; I.W., Rare, Parkhurst, Freshw., Bembridge, I.W.G.

*Demas coryli*.—N.F., c., M., Ht., N.; Soton, occ., F., A.; Ch. Fd., sc., R.; Crab Wood, c., Ht.; Ptsmth., c., B.; Havant, f. c., E.; Alton, f. c., S.; Doles Wood, H.; I.W., Shanklin, 1 sp., I.W.N.H.S.

*Acronicta leporina*.—N.F., occ., Pe., T.; f. c., B.; Holmsley, R.; Christch., Dt.; Soton, f. c., F., A.; Bassett, occ., M.; Ch. Fd., n. c., R.; Crab Wood, St. Cross, Ht.; Winton, occ., M.; Ptsmth., n. c., B.; Fareham, H.; Pamber, Harewood, occ., H.; I.W., n. c., I.W.G.

*Apatela aceris*.—N.F., Hk., N.; n. c., B.; Christch., Dt.; Fdge., n. c., Ct.; Soton, occ., F., M.; Ch. Fd., sc., R.; Romsey, Pe.; Winton, c., Ht.; Fareham, H., T.; Ptsmth., n. c., B., Hk.; Havant, occ., E.; Andover, H.; Sth. of Newbury, Sl.; I.W., c., I.W.G.

*Cuspidia megacephala*.—N.F., Pe.; Rhamnor., R.; Ringwood, N.; Bnmth., Ct.; Christch., Dt.; Soton, f. c., F., A.; Ch. Fd., sc., R.; Winton, Ht.; Ptsmth., loc. c., B.; Fareham, occ., H.; Alton, 1 sp., S.; Aldershot, c., Sn.; Sth. of Newbury, Sl.; I.W., c., I.W.G.

*Jocheaera alni*.—N.F., r., M., J., etc.; Ringwood, N.; Holmsley, R.; Soton, r., A.; Ch. Fd., r., R.; Winton, Ht.; Ptsmth., B.; Sheepwash, r., Ps.; Privett, r., T.; Burghelere, Highelere, occ., Sl.; I.W., old records only.

*Triana tridens* and *T. psi*.—Those who have reared and so differentiated these two species, record them equally c. ev.

*Phaetrea auricoma*.—Titchfield, H.F.C.; larvae on raspberry, 1871, W.L., '75.

*Phaeretra runcicis*.—Soton, f. c., F., A.; Eastleigh, occ., F.; Ch. Fd., r., R.; Winton, f. c., Ht.; Swanwick, n. c., A.; Lee on Solent, Hk.; Horndean, r., B.; Sth. of Newbury, Sl.; I.W., Sandown, Freshw., Newport, Yarmouth, I.W.G.

*Bisulcia ligustri*.—Ringwood, N.; Soton, occ., F.; Romsay, Pe.; Ch. Fd., A.; Hursley, Winton, occ., M.; Crab Wood, f. c., Ht.; Ptsmth., r., B.; Havant, 1 sp., E.; Alton, f. c., S.; Harewood, 1 sp., Pamber, 1 sp., H.; Sth. of Newbury, Sl.; I.W., Freshw., Sandown, St. Helens, I.W.G.

*Bryophila perla*.—Gen. dist. and c.; Rare in N.F.

*Bryophila muralis (glandifera)*.—Ringwood, N.; Christch., f. c., R.; Ptsmth., n. c., B.; Southsea, Hk.; Fareham, 1 sp., T.; Sth. of Newbury, Sl.; I.W., n. c., A.; Freshw., singly, *E.R.*, III. 235; f. c. throughout, I.W.G.

*Agrotis segetum*.—Abt. ev.

*Agrotis vestigialis*.—Ringwood, N.; On the coast, Ht.; nr. Ptsmth., Ps.; Hayling, f. c., B., E.; I.W., St. Helens, c., I.W.N.H.C.

*Agrotis corticea*.—Gen. dist. and f. c.

*Agrotis cinerea*.—Ch. Fd., 1 sp., R.; occ., A.; Winton, n. c., Ht., T., M., A.; Horndean, n. c., B.; Portsdown Hills, n. c., T.; Pamber, 1 sp., H.; I.W., Vent., occ., C.; Very uncommon, I.W.G.; Freshw., Pe.

*Agrotis puta*.—Gen. dist. and c.

*Agrotis lunigera*.—I.W., Freshw., abt., T., M., A., etc.; Cliffs, Ht.; Sandown, *E.R.*, V. 227.

*Agrotis cursoria*.—Hayling, f. c., B.

*Agrotis nigricans*.—N.F., Ringwood, N.; Fdge., Ct.; Bassett, A.; Ch. Fd., n. c., R.; Portsdown Hills, c., H., B.; Ptsmth. and Hayling salterns, f. c., B., Ps.; I.W., Freshw., f. c., M.; Sparingly, I.W.G.

*Agrotis tritici*.—Ringwood, N.; Hayling, abt., B.; Havant, f. c., E.; Sth. of Newbury, Sl.; I.W., Freshw., c., Pe., M.; St. Helens, c., B.; Sandown, n. c., I.W.G.

*Agrotis aquilina*.—N.F., sc., B.; Ringwood, N.; Boscombe, r., R.; Hayling, sc., B.; I.W., Freshw., n. c., M.; Shanklin, Sandown, I.W.G.

*Agrotis obelisca*.—Bnmth., *E.R.*, IX. 39; I.W., Freshw., c., M., T., Ht., etc.; Vent., Newport, Niton, Freshw., I.W.G.

*Agrotis exclamationis*.—Abt. ev.

*Agrotis ypsilon (suffusa)*.—Gen. dist., f. c.

*Agrotis ripae*.—Mudiford, A.; Ptsmth., C., B.; Hayling, abt., T., E., etc.; I.W., St. Helens, abt., T.; Freshw., f. c., M., Pe.

*Agrotis strigula*.—Well dist. on heaths and commons, c.; I.W., nr. Sandown, I.W.G.

*Agrotis praecox*.—Pokesdown, H.F.C.

*Agrotis saucia*.—Gen. dist, sometimes c.

*Agrotis lucerneae*.—Bassett, 1 sp., A.; Meon Valley, sc., H.F.C.; I.W., Freshw., T., M., etc.

*Agrotis simulans*.—I.W., v. r., I.W.G.

*Agrotis agathina*.—N.F., loc., f. c., B., M., Ht.; Ringwood, N., Bassett, r., A.; Ch. Fd., loc., f. c., R., Pe.

*Agrotis obscura*.—Bassett, 1 sp., A.; Portsdown Hills, 1 sp., 1921, Ps.

*Noctua augur*.—N.F., c., T., B.; Ch. Fd., r., R., A.; Crab Wood,

n. c., Ht.; Purbrook, n. c., B.; Havant, n. c., E.; Alton, S.; Monxton, Pamber, H.; Sth. of Newbury, Sl.

*Noctua glareosa*.—N.F., formerly, Ht.; Christch., r., R.; Purbrook, n.c., B.; I.W., Freshw., 1 sp., *E.R.*, V. 263; Sandown, Freshw., fairly plentiful, I.W.G.

*Noctua castanea*.—N.F.; f. c., T., M., B.; Ly., Ht.; Sway, Ct.; Bassett, A.; Pamber, all forms c., H.; Sth. of Newbury, Sl.; var. *neglecta* is the usual form in N.F.; I.W., n. c., var. *neglecta* only, I.W.G.

*Noctua baja*.—Gen. dist., more or less c.

*Noctua c-nigrum*.—Gen. dist., c.

*Noctua flammatra*.—Two of the three Brit. sp. from I.W., 1859, 1876, *M.B.I.*, I. 222.

*Noctua ditrapezium*.—N.F., r., B.; Horndean, r., B.; Pamber, 1 larva, H.

*Noctua triangulum*.—Gen. dist., more or less c.

*Noctua stigmatica*.—N.F., f. c., Pe., B., V.; Ch. Fd., sc., R.; Farley Mt., f. c., Ht.; Michelmersh, c., M.; Horndean, n. c., B.; Alton, S.; Monxton, Harewood, H.

*Noctua brunnea*.—Gen. dist., c.; I.W., Freshw., I.W.G.

*Noctua primulae (festiva)*.—Gen. dist., c.

*Noctua dahlia*.—N.F., f. c., Pe., M.; Farley Woods, occ., Ht.; Michelmersh, f. c., M.; Harewood, H.; Sth. of Newbury, Sl.; I.W., old records only.

*Noctua rubi*.—Gen. dist., c.

*Noctua umbrosa*.—N.F., n. c., B., M.; Bassett, r., A., Ch. Fd., c., R.; Winton, occ., Ht.; Purbrook, n. c., B.; Ovington, c., S.; Sth. of Newbury, Sl.; I.W., Sandown, I.W.G.

*Noctua xanthographa*.—c. ev.

*Noctua plecta*.—Gen. dist., c.

*Axylia putris*.—N.F., Bramshaw, sc., B.; Ringwood, N.; Soton, occ., F., A.; Romsey, occ., Pe., M.; Ch. Fd., sc., R.; Winton, Ht.; Ptsinth., n. c., B.; Havant, occ., E.; Fareham, Andover, H.; Sth. of Newbury, Sl.; I.W., c., I.W.G.

*Triphaena comes*.—c. ev.

*Triphaena orbona (subsequa)*.—N.F., n. c., M., B., T.; South and East of N.F., V.; Fdge., Ct.; Christch., Dt.; Soton, r., F., A.; Ch. Fd., n. c., R.; Winton, f. c., Ht.; Michelmersh, n. c., M.; Monxton, Harewood, H.; I.W., n. c., B.; Freshw., abt., *E.R.*, V. 268; Cowes, Sandown, Parkhurst, Vent., I.W.G.

*Triphaena pronuba*.—Abt. ev.

*Triphaena fimbria*.—Gen. dist., more or less c.

*Triphaena ianthina*.—Gen. dist., more or less c.

*Triphaena interjecta*.—N.F., c, B.; Ringwood, N.; Soton, f. c., F.; Ch. Fd., sc., R.; Crab Wood, Ht.; Marchwood, Hk.; Portsdown, f. c., B.; Havant, f. c., E.; Gen. dist. in North, H., Sl.; I.W., Freshw., f. c., Pe., M.; f. c., I.W.G.

*Euviois prasina*.—c. in all larger woods.

*Aplecta tincta*.—Ch. Fd., r., R.; Eastleigh, occ., K.; Winton, f. c., M.; Crab Wood, sometimes c., Ht.; Pamber, c., H.

*Aplecta advena*.—Christch., Dt.; Soton, f. c., M.; Bassett, 1 sp., A.; Winton, f. c., M., Ht.; Alton, 2 sp., S.; Woolmer, c., E.; Sth. of Newbury, Sl.; I.W., Fresh W., occ., I.W.G.

*Aplecta nebulosa*.—c. ev. in woods.

*Barathra brassicae*.—c. ev.

*Mamestra persicariae*.—c. ev.

*Mamestra albicolis*.—Bnmth., Ct.; Christch., H.F.C.; Hayling, T.; Nr. Ptsmth., sometimes abt., Ps., B.

*Mamestra oleracea*.—c. ev.

*Mamestra genistae*.—N.F., f. c., B.; Ringwood, N.; Soton, f. c., A.; Ch. Fd., sc., R.; Romsey, Pe.; Winton, f. c., M., F.; Portsdown, n. c., B.; Alton, Itchen Abbas, S.; Harewood, Pamber, H.; Sth. of Newbury, Sl.; I.W., Sandown, n. c., T.; Freshw., Vent., I.W.G.

*Mamestra dissimilis*.—N.F., Pe., Ht.; Havant, c., T., E.; Ptsmth. salterns, c., B.; Cosham, Hayling, Ps.; I.W., Sandown, Freshw., c., I.W.G.

*Mamestra thalassina*.—N.F., Ringwood, N.; Forest Side, Hk.; Bassett, A.; Ch. Fd., f. c., R., A.; Romsey, Pe.; Winton, c., Ht., M.; Portsdown, c., B.; Pamber, c., H., T.; Harewood, c., H.; Sth. of Newbury, Sl.; I.W., Freshw., I.W.G.

*Mamestra contigua*.—N.F., sometimes c., Pe., B.; Bnmth., f. c., M.; Bassett, Hursley, f. c., M.; Romsey, Pe.; Ch. Fd., r., R., A.; Crab Wood, 1 sp., Ht.; Horndean, n. c., B.; Pamber, r., H.; I.W., old records only.

*Mamestra pisi*.—N.F., n. c., B., M.; f. c., Ht.; Ringwood, N.; Milford, Ct.; Soton, sc., F.; Ch. Fd., sc., R.; Romsey, Pe.; Oakhanger, S.; Sth. of Newbury, Sl.; Langley Clumps, 1 larva, H.; I.W., Lake, a few larvae, I.W.G.

*Mamestra trifolii*.—N.F., Bramshaw, occ., B.; Ly., *E.R.*, XI. 347; Christch., R., Dt.; Romsey, Pe.; Winton, loc. c., Ht.; Havant, c., T., E.; Fareham, c., T., H.; Hayling, c., E.; I.W., Freshw., f. c., M.; Shanklin, Sandown, f. c., I.W.G.

*Mamestra nana (dentina)*.—Gen. dist., usually c.

*Mamestra peregrina*.—3 Brit. sp. all at Freshw., *M.B.I.*, I. 246, I.W.G.

*Dianthoecia conspersa*.—Romsey, Pe.; Winton, a few sp., Ht.; Fareham, n. c., T.; Portsdown, n. c., B.; Alton, 1 sp. bred, S., Colmer, H.F.C.; Monxton, occ., H.

*Dianthoecia albimacula*.—1 sp. at Gosport, 1865, H.F.C., T., *M.B.I.*, I. 249.

*Dianthoecia capsicola*.—N.F., Bramshaw, c., B.; Ringwood, N.; Soton, n. c., M., F.; Ch. Fd., c., R., A.; Eastleigh, f. c., K.; Romsey, Pe.; Winton, c., Ht., K.; Portsdown, f. c., B.; Alton, occ., S.; Sth. of Newbury, Sl.; I.W., c., I.W.G.

*Dianthoecia cucubali*.—N.F., Bramshaw, sc., B.; Ringwood, N.; Christch., Dt.; Milford, abt., Ct.; Soton, n. c., F.; Ch. Fd., sc., R., A.; Eastleigh, f. c., K.; Romsey, Pe.; Winton, occ., Ht.; Portsdown, n. c., T.; Hayling, f. c., B., E.; Ditcham, f. c., B.; Alton, occ., S.; Monxton, c., H.; Sth. of Newbury, Sl.; I.W., Sandown, occ., Freshw., I.W.G.

*Dianthoecia carpophaga*.—Ringwood, N.; Soton, f. c., F., A.; Netley, f. c., K.; Ch. Fd., f. c., Farley, c., R.; Romsey, Pe.; Portsdown, n. c., T.; Hayling, Ditcham, f. c., B.; Havant, f. c., E.; Alton, c., S.; Monxton, c., H.; Sth. of Newbury, Sl.; I.W., Sandown, r., I.W.G.

*Hecatera chrysozona*.—Occurs, V.

*Hecatera serena*.—Gen. dist. except N.F., f. c.

*Neuria reticulata*.—Fdge., f. c., Ct.; Romsey, Pe.; Winton, occ.,

Ht.; Ptsmth., n. c., B.; Fareham, occ., T.; Alton, occ., S.; Andover, c., H.; Sth. of Newbury, Sl.; I.W., Sandown, occ., Newport, Shanklin, I.W.G.

*Epineuronia popularis*.—Gen. dist., sometimes c.

*Tholera cespitis*.—N.F., f. c., Ht., M.; Ringwood, N.; Christch., n. c., M., R., Dt.; Bassett, r., A.; Ch. Fd., sc., R., A.; Fareham, 1 sp., T.; Ptsmth., B.; Havant, n. c., B.; Silchester, c., H.; I.W., Freshw., *E.R.*, VI. 304, etc.

*Charaëas graminis*.—Ringwood, N.; Bnmth., n. c., M.; Rockbourne, 1 sp., Ct.; Hursley, n. c., M.; Romsey, Pe.; Winton, n. c., *W.L.*, 1891; Hayling, sc., B., E.; Hyden Wood, sc., B.; Fareham, Kingsclere, H.; Selborne, H.F.C.; Sth. of Newbury, Sl.; I.W., Sandown, Vent., single sp., I.W.G.

*Eumichtis adusta*.—N.F., f. c., B.; Ringwood, N.; Ch. Fd., r., R.; Romsey, Pe.; Crab Wood, r., Ht.; Portsdown, f. c., B.; Woolmer, f. c., E.; Harewood, Pamber, H.; Sth. of Newbury, Sl.; I.W., Sandown, n. c., I.W.G.

*Eumichtis protea*.—Gen. dist., sometimes abt. Usually very variable.

*Bombycia viminalis*.—N.F., f. c., B.; Ringwood, N.; Soton, f. c., F., A.; Ch. Fd., c., R., A.; Romsey, Pe.; Winton, f. c., M.; Crab Wood, Ht.; Portsdown, f. c., B.; Fareham, n. c., T.; Alton, f. c., S.; Pamber, occ., H.; Sth. of Newbury, Sl.; I.W., Bembridge, St. Helens, 1 sp., I.W.G.

*Eremobia ochroleuca*.—Christch., H.F.C.; Winton, 1 sp., 1872, *W.L.*, 1875; I.W., Sth. coast, V., H.F.C.; Bembridge, Sandown, I.W.G.

*Diloba caeruleocephala*.—Gen. dist. more or less c.

*Heliophobus hispidus*.—I.W., Freshw., 1 sp., *E.R.*, V. 229; Freshw., sc., I.W.G., Pe.

*Luperina testacea*.—Gen. dist., c.

*Luperina dumerilii*.—I.W., Freshw., 3 sp., 1859, I.W.G.

*Cerigo matura*.—N.F., n. c., M., B.; Bassett, c., A.; Ch. Fd., n. c., R., A.; Marchwood, Hk.; Romsey, Pe.; Shawford, occ., K.; Portsdown, n. c., B., H., T.; Hayling, f. c., E.; Andover, H.; Sth. of Newbury, Sl.; I.W., Newport, f. c., B.; Sandown, c., I.W.G.

*Celaena haworthii*.—Nr. Sandown, 1 sp., *E.R.*, XIX. 303; Occurs, V.

*Hama abjecta*.—Christch., Dt.; Fareham, Cosham, T., H.; Hayling, f. c., B., Ps.; Havant, T., E.; I.W., Sandown, Freshw., Pe., *M.B.I.*; I. 270; Yarmouth, St. Helens, I.W.G.

*Hama sordida*.—Ringwood, N.; Bassett, f. c., A.; Ch. Fd., sc., R.; Romsey, Pe.; Winton, c., Ht.; Fareham, c., T.; Portsdown, c., B.; Gen. dist. in Nth., H.; Sth. of Newbury, Sl.; I.W., Sandown, Freshw., c., I.W.G.

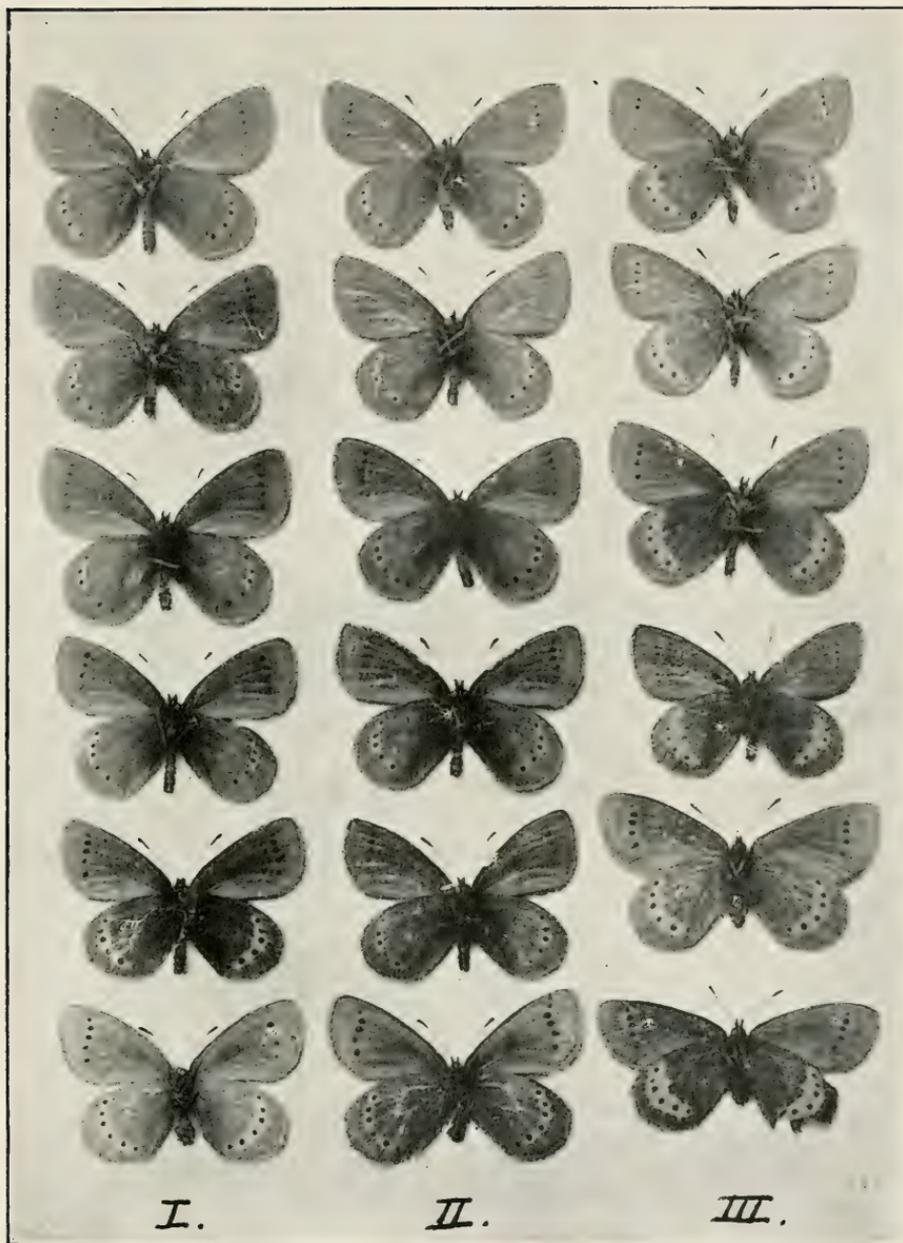
*Hama furva*.—Occurs, V.; Ringwood, N.; Fareham, 1 sp. H.; Little Park, Hk.; Winton, a doubtful record, Ht.

*Apamea gemina*.—Gen. dist., more or less c.; Winton, a banded form, Ht.

*Apamea basilinea*.—Gen. dist., c.

*Apamea unanimis*.—Shawford, n. c., R.; Romsey, Pe.; Winton, c., Ht.; Havant, 1 sp., E.; n. c., B.; Alton, Ovington, occ., S.; Pamber, Monxton, H.; I.W., Sandown, 1 sp., St. Helens, I.W.G.

*Apamea secalis (didyma)*.—Abt. ev.



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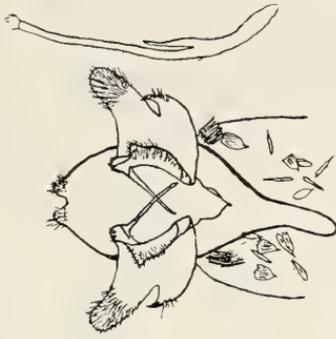
*Photo. B. C. S. Warren.*

EREBIA FLAVOFASCIATA.

I. & II. The Tschierva race.  
Last figure of each ♀.

III. The Campolungo race.  
Last 2 figs. ♀.

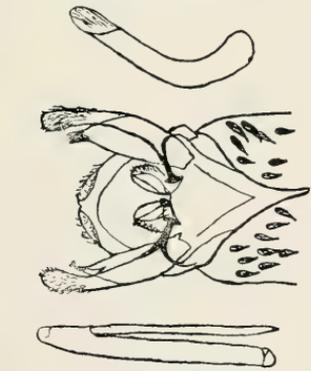




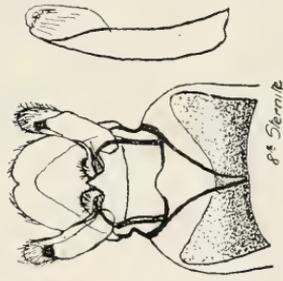
*Diplobotoma herminata.*



*Fumea casta - opened.*



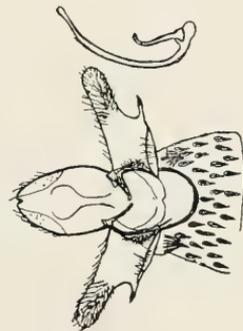
*Fumea casta.*



*Whiteleia undulata.*  
C.R.N.B. det.



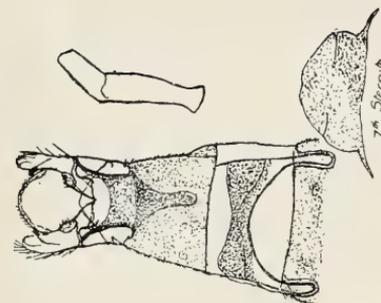
*Dissocleina albidella.*



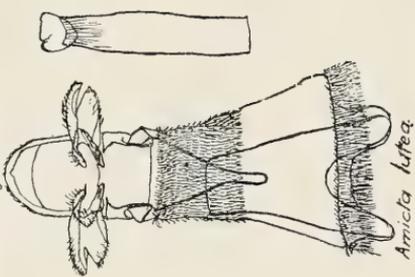
*Solenobia inconspicuellae.*  
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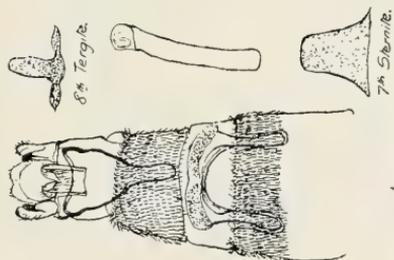


*Acanthopsyche atra.*

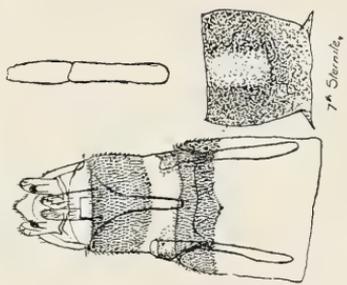


*Amicta lutea.*

C.R.N.B. del.

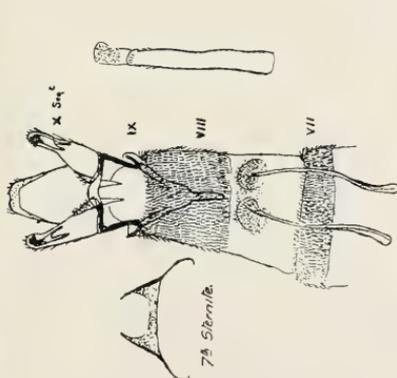


*Arcus bruandi.*

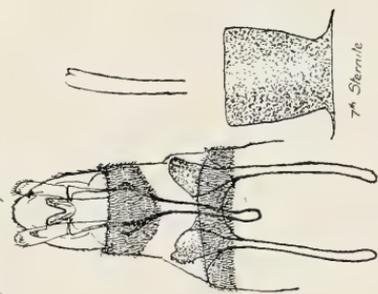


*Philocephala plumifera.*

FINAL SEGMENTS OF MALE PSYCHIDES.



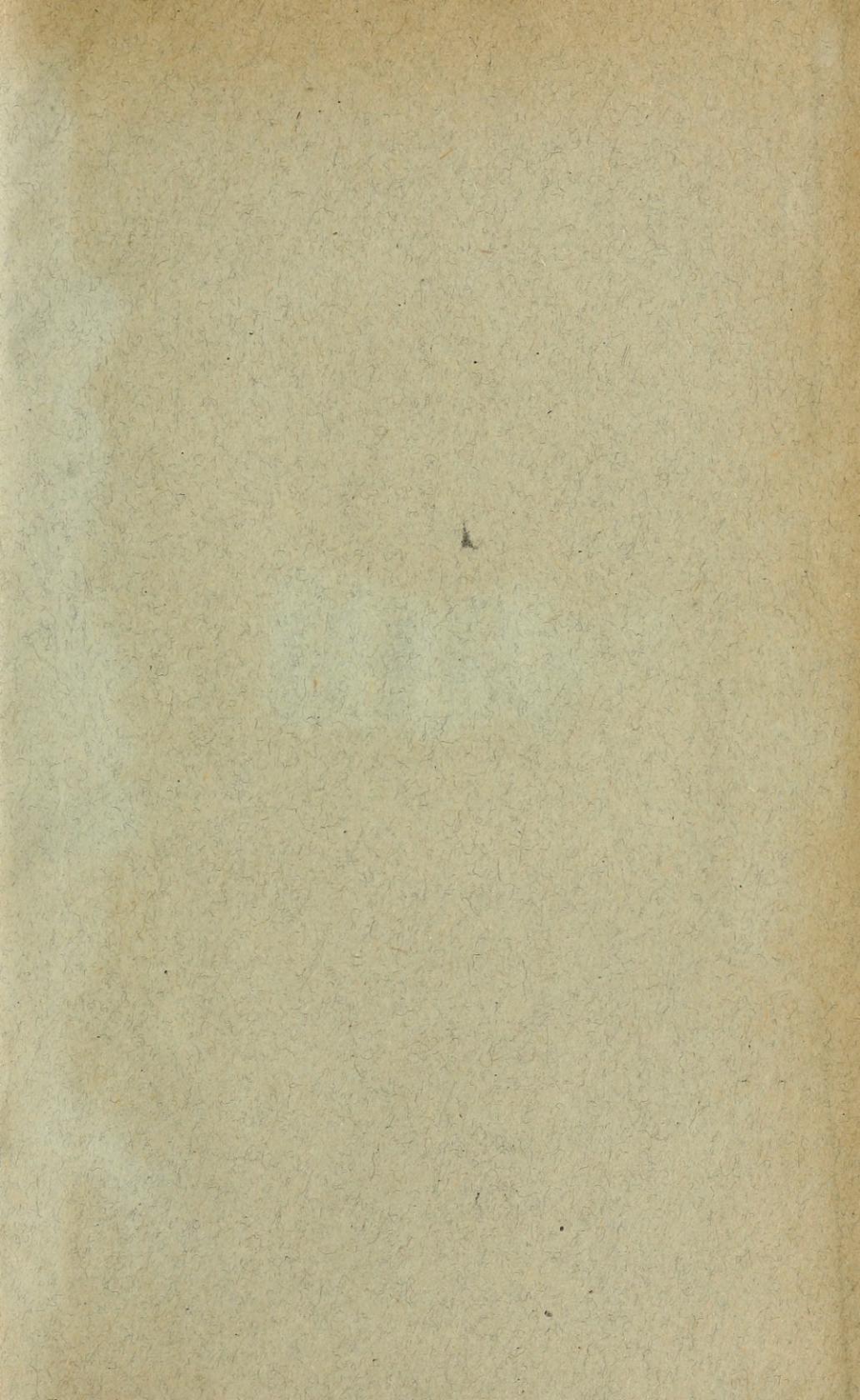
*Apterana pusilla.*



*Oreopsyche leschenadti.*

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